An Argus Specialist Publication

MSX User

SEPTEMBER 1985
£1.25

MSX TEACH-IN: join our computer weekend

MSX Plus – the full details

Word processing: Bank Street Writer

Profile: the Japanese connection

Introducing Machine Code

PLUS

Latest games reviewed
Best readers' listings
Programming tips

MITSUBISHI ML-F80 AND SOFTWARE TO BE WON

DOMARK

presents

YOU as . . .

007

A VIEW TO A KILL
THE COMPUTER GAME

NOW YOU ARE
JAMES BOND

IN HIS FIRST ARCADE/ADVENTURE AVAILABLE ON THE MSX

© Eon Productions Ltd. Glidrose Publications Ltd. 1985
Domark Ltd., 204 Worple Road, London SW20 8PN. Tel: 01-947 5624 Telex: 894475 G

ORDER YOUR COPY NOW!
CALL 01-947 5624

DOMARK

To: Domark Ltd., 204 Worple Road, London SW20 8PN
Telex: 894475 G

NAME: (BLOCK LETTERS) .....

ADDRESS .....

COUNTY ..... POSTCODE .....

Please send me ..... copies of "A View to a Kill – The Computer Game" at £10.99 (includes postage and packing).

I enclose a cheque/P.O. for £.....

My computer is: .....

You may order by Access ☐ Visa ☐ American Express ☐ by post or telephone (01-947 5624).
Please debit my CREDIT CARD ☐ Signature:.....

Account No: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Expiry Date: ..... MXU

Contents

MSX User

REGULARS

5 Front — Looking ahead
6 Pulse — What's new on the MSX scene
8 East — Graham Knight was where it all happens
56 Contact — Who supplies what software
62 First Aid — Steve Webb deals with the problem of saving graphics to tape
64 Feedback — Your news and queries

COMPETITION

25 Win a Mitsubishi — Just answer five simple questions about wrecks to win Electric Software's superb prizes
66 Sanyo Lightpen — Smiles all round for the winning entry in our June contest

FEATURES

14 Second Generation — Karl Dallas takes a closer look at MSX Plus
18 Japanese Connection — Eric Doyle profiles Nemesis Distribution
52 Pathfinder — Steve Lucas explores three adventurers from Kuma

PROGRAMMING

22 Grand Design — Bob Maunder's new series helps you to write programs which work first time
44 MSXplained — Take the pain out of entering listings
46 Starting Out — First steps in MSX BASIC
48 Quick Answers — Liven up your programs with Steve Webb's simple machine code routines

REVIEWS

20 Package Deal — The pros and cons of Toshiba's new word processor
26 Flat Spin — Karl Dallas checked out the Triton Quick-Disk
43 Sound Investment — Tuning in to Rittor's music utilities

HOLIDAY OFFER

16 MSX Teach-In — An unmissable chance to get to grips with your MSX

LISTINGS

28 Numbers Crossword — Mind tester
32 Hangman — Macabre fun
36 Rabbit Run — A-mazing
39 The Island — Maritime adventure
59 Word Van — Educational game

The contents of this publication including all articles, designs, plans, drawings and programs and all copyright and other intellectual property rights therein belong to Argus Specialist Publications Limited. All rights conferred by the Law of Copyright and other intellectual property rights and by virtue of international copyright conventions are specifically reserved to Argus Specialist Publications Limited and any reproduction requires the prior written consent of the Company. © 1985 Argus Specialist Publications Limited.

Editor
Nicole Segre

Editorial Assistant
Eric Doyle

Group Editor
Dave Bradshaw

Advertisement Manager
Ian Atkinson

Advertisement Copy Control
Lynn Collis

Publishing Director
Peter Welham

Origination and Design
Argus Design

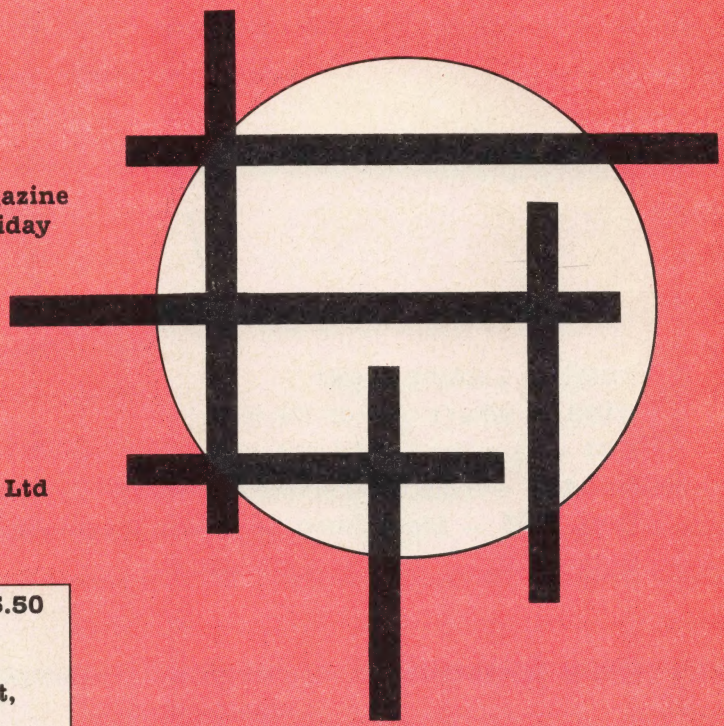
Editorial & Advertisment Office
No 1 Golden Square
London W1R 3AB
Tel: 01-437 0626
Telex: 8811896

MSX User is a monthly magazine appearing on the second Friday of each month

Distribution
SM Distribution Ltd
16-18 Trinity Gardens
London SW9 8DX

Printing
Alabaster Passmore & Sons Ltd
Tovil, Maidstone, Kent

UK Subscription rates £15.50 per annum. Worldwide on application to MSX User Subscriptions Department, Infonet Ltd, Times House, 179 The Marlowes, Hemel Hempstead, Herts. HP1 1BB



If you think that you have written a program as good as the ones we publish, why not turn your hard work into cash?

Send us a tape of the program along with a written description of the game, playing instructions, the main variables used and a brief explanation of your programming structure (see the Listings page for guidance). A printout of your program would be useful, but is not essential.

If we agree that your work is a masterpiece we will pay you £15-£50 on publication, depending on its length and complexity.

All programs and documentation should be sent to:

MSX User
Argus Specialist Publications Ltd
1 Golden Square
London W1R 3AB.

NEXT MONTH

Pathfinder — Learn about adventure programs from Steve Lucas
Heated Words — Karl Dallas reports on Alphacom's thermal printer
First Editions — Bumper round-up of MSX books
Primary Aims — In-depth look at Morwood's educational series for small children
Joy Ride — We try out the latest games controllers

MSX Front

As from this month, the price of MSX User goes up to £1.25. It is with great regret that we announce this increase which has been forced upon us by rising production costs.

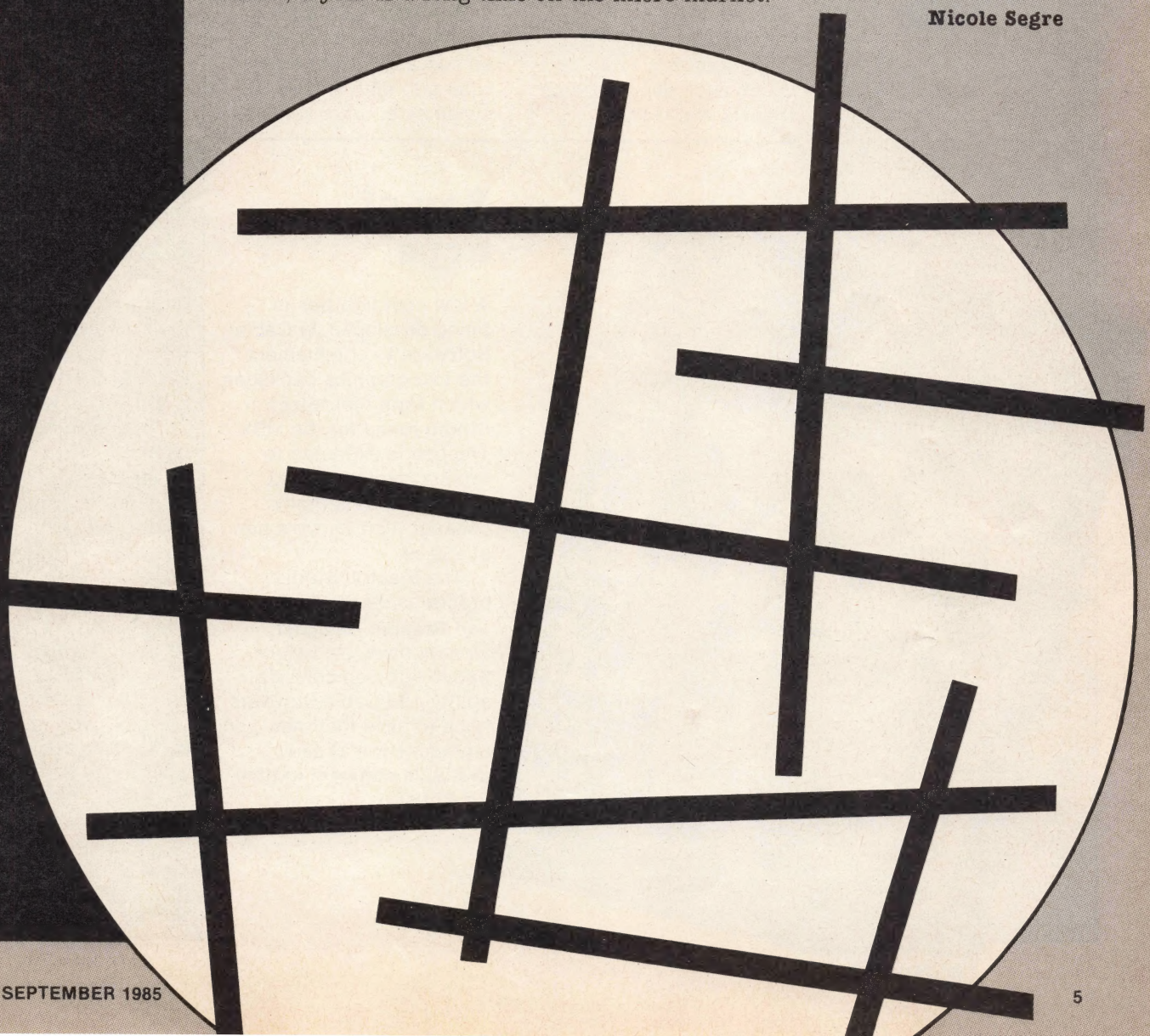
The good news, however, is that we are still here and still bringing you the very best in MSX information and news of every kind as we have done since our launch last December. Stick with us and we think you will agree that even at the current price MSX User still offers unbeatable value.

In this issue, as well as our usual features, reviews and listings, we are introducing two superb new programming series. One is by Bob Maunder who follows up his popular On File articles with an invaluable course on program structure; and one by Steve Webb which provides a collection of simple machine code routines to give your programs a thoroughly professional air. We also have a holiday offer which we think you should not refuse.

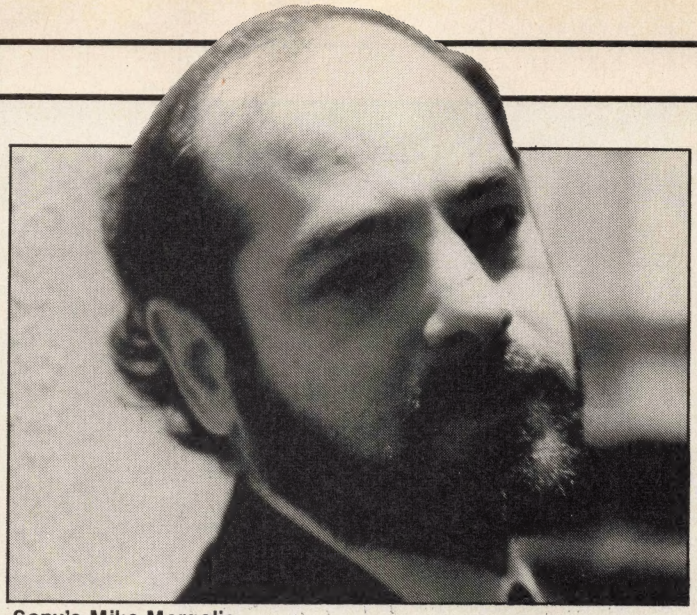
As the summer season nears its end, there might seem to be not much for us here to feel optimistic about. In recent months, the three major British micro manufacturers — Sinclair, and Commodore and Acorn, — have all faced serious difficulties. On the MSX front, dealers like Comet and Dixon's appear to have taken fright and cleared their shops of existing stock. The micro market, having grown too fast for its own good, appears to be sinking painfully back into normality — and in the long run, this can only be good for MSX. With the promise of MSX Plus, combining exciting new possibilities and compatibility with the existing generation of machines, MSX will become a strong contender on that sector of the British micro market which still remains to be captured — as it is already proving itself to be on the fresher fields of Europe.

Let us hope, however, that the Japanese manufacturers will not be too complacent and delay too long in bringing MSX Plus into the light of day. The most likely estimate of the new machines' appearance in Britain is around summer 1986, perhaps a year from now. To paraphrase Harold Wilson, a year is a long time on the micro market.

Nicole Segre



Pulse



Sony's Mike Margolis

MSX road-show

Members of the MSX Working Group demonstrated the system at a recent meeting of the Croydon Micro Club.

Mike Margolis, Sony's Business Manager, and the MSX PR team from the Grayling Company took three complete systems which each demonstrated the mix and match capabilities of the MSX standard. Applications packages were also on show demonstrating graphics and communications systems. The highlight of the evening was an opportunity to question Mike Margolis on technical aspects of the computers.

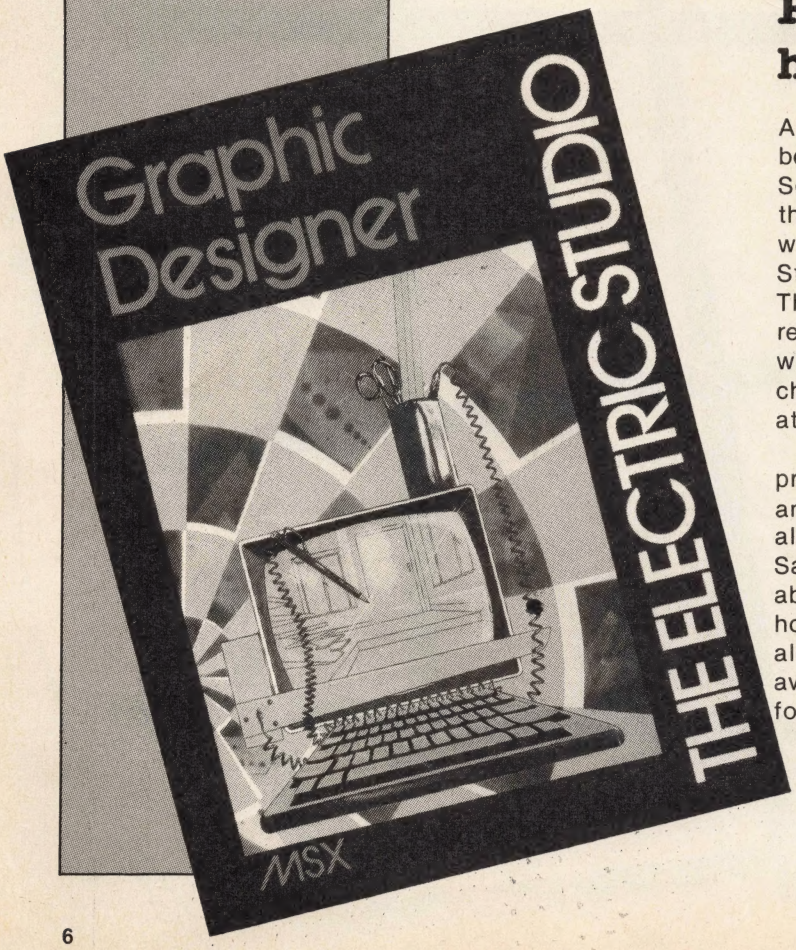
The MSX team considered the evening to be so successful that they are willing to plan similar evenings at other venues.

Danish club

Word from the Danish MSX users club informs us that the club, which was formed as a Spectravideo user group in July 1984, now has 200 members including 15 from Norway. The club publishes a newsletter ten times a year.

According to the club chairman, Torben Geuken, the Danish market already offers the Spectravideo, the Sony Hit Bit and the Yamaha, and other machines are expected to follow in the autumn. Many of the MSX books published in Britain are available in Denmark, as is the Kuma range of software, and, of course, our very own *MSX User.*

The Danish MSX Users Club can be contracted at Suderlaengen 14, 2620 Albertslund, tel: 02-64 67 73.



Ray of hope

A low cost lightpen is being developed by Cable Software to complement the two graphics packages which form their Electric Studio range for the MSX. The pen is expected to retail at around £20-25 which is substantially cheaper than Sanyo's pen at £89.99.

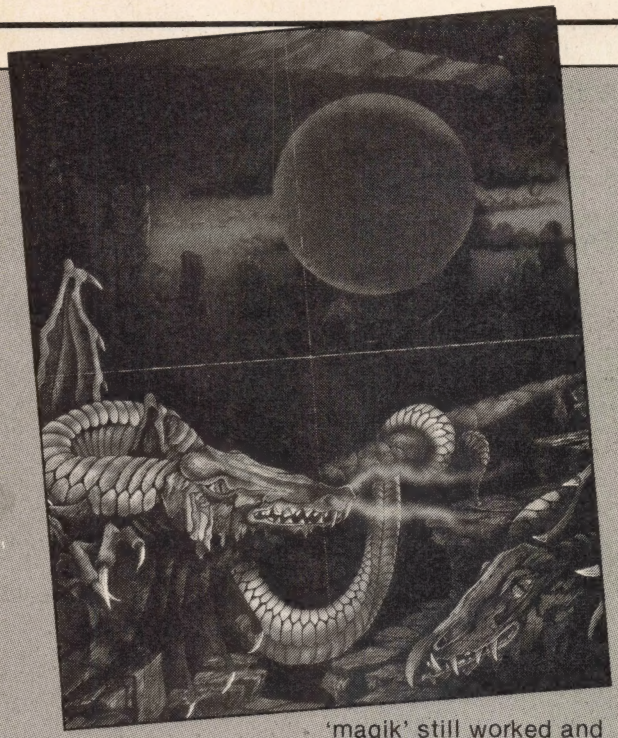
The Electric Studio programs, **Sprite Editor** and **Graphic Designer,** already have joystick or Sanyo lightpen compatability and Cable Software hope to have their new pen alongside the already available software in time for Christmas.

Hot lines

Canon have filled a gap in their product range with the release of an MSX thermal dot-matrix printer costing £149 plus VAT.

The T-22A has three character sizes: standard, condensed and enlarged. Standard mode allows 80 characters per line at a rate of 56 characters per second (cps) while condensed mode allows 140 characters per line at 62 cps. Enlarged mode prints 40 characters per line. The thermal paper used by the machine can be either sheet or roll fed.

The machine is about the size of a telephone directory and weighs only 3Kg. It supports the full MSX character set and also permits hi-res screen dumps.



Red alert

Level 9 have added to their list of MSX adventure programs with the release of **Red Moon.** The game has over 200 locations with graphics and is set in a time when 'magik' still worked and monsters guarded fabulous treasure.

The cassette costs £6.95 and can be obtained by mail order service from Level 9 Computing, PO Box 39, Weston-super-Mare, Avon BS24 9UR (add £1 if outside the UK).

Joint stand

The four main members of the MSX Working Group, together with Microsoft, inventors of the MSX system, are planning a major assault on public awareness at the Personal Computer World show which takes place at Olympia on September 4 — 8.

JVC, Mitsubishi, Sony and Toshiba will exhibit their MSX wares at a large joint stand, and will demonstrate software applications ranging from music, education, home and business to the as yet vaguely define 'future technology'. A bank of machines running round the stand will continuously run games.

Tom Sato, European MSX manager for Microsoft, does not rule out the possibility that MSX Plus will be on view at the show. 'More important than the machines themselves,' he says, 'is the fact that Microsoft will have a substantial shock of documentation on MSX Plus available for developers and software houses.'

A hospitality suite for British and foreign dealers and software houses is also planned, along with a series of trade seminars and press conferences.

The price is right

Wholesale warehouse chain Comet and the high street retailers Dixon's are both selling MSX computers at bargain prices. Comet say the cuts are part of a general winding down of micro business, and that they will not be re-stocking any home computers except the Amstrad for the moment.

John Locke, PR officer for the MSX Working Group, commented: 'Under EEC rules, manufacturers cannot dictate individual companies' pricing policies. If a retailer decides to sell an MSX for 10p, that is his own affair. Obviously, the manufacturers are not pleased about recent moves which give the impression of a price war but apart from confirming that this is a temporary state of affairs, their hands are tied.'

For the consumer the price cuts of over £100 on Canon, Sanyo and Sony machines has meant Japanese machines available within the competitive £100-£200 price bracket and Dixon's offer of Toshiba's at £99.95 was a bargain not to be missed. These prices, however, will exist only dor as long as existing stocks last and it appears that the supply is already nearing exhaustion.

It's M.U.D.ness

British Telecom is launching its own version of M.U.D. — short for Multi-User Dungeon — at the PCW show this September. Anyone with a micro—including MSX owners—and a modem will be able to access the game, which will run on a VAX 750. Up to 100 people will be able to play simultaneously, and according to New Information Services, BT's software and electronic publishing subsidiary in charge of the project, this will make it the largest role-playing interactive computer game in the world.

Since it was first devised for the Essex University Dec 10 by Roy Trubshaw and lecturer Richard Bartle five years ago, M.U.D. has achieved a cult following. The Essex University machine has some 2000 subscribers who regularly log on, up to 30 at a time, between the hours of 2am and 8am. The game is also available on the Commodore network Compunet.

New Information Services claim that their version will have many more locations, objects, treasures and characters than any other, as well as a wider variety of commands and spells. A permanent Arch-wizard will be on the look-out for foul play. 'With so many people playing at the same time, the interaction of players and characters should provide a much more complex game than has so far been seen,' says project manager Trevor Havelock.

Subscribers to the system must have a computer terminal, a telephone and a modem. For an initial fee of £20, they will then receive a 'M.U.D. pack', which includes instructions, a map, and two hours of introductory play. Thereafter, the game will cost £2 per hour, on top of telephone charges.

'The M.U.D. project may sound daft,' says Trevor Havelock, 'but if we have done our sums correctly, it should make sound commercial sense.' Out of a total user base of some 2 million home computer owners, BT hope to 'hook' around 10,000 M.U.D. players in the first year of operation. 'Another benefit' says Havelock, 'is that the game will increase public awareness of communications. Playing M.U.D. may open the door for many to other networks and databases. Besides that, it is good fun, and we see nothing wrong in that.'

East

Graham Knight was in Tokyo to hear the announcement of MSX Plus

Graham Knight (right) in Japan with Toshio Terada, Toshiba director in charge of MSX.

MSXtra

When Kay Nishi, the inventor of MSX, recently held a press conference to announce an enhanced standard known as MSX Plus, representatives of all the participating MSX manufacturers and reporters from the international business and computer press were present at the Tokyo headquarters of ASCII-Microsoft.

Mr. Nishi outlined the MSX Plus concept, which had been designed around an entirely new video processor chip, and spoke of the wide acceptance of the present MSX standard which has already sold 800,000 units and been accepted by manufacturers worldwide.

The newly defined MSX Plus, he said, was an enhancement of the existing standard which would give higher graphic resolution, more colours, improved sound capabilities, an 80-column display, and a total built in memory of 240K.

MSX Plus computers can have an optional video digitizer which can transfer TV, video tape or disk pictures to the MSX Plus video memory for future computer recall and modification. Mr. Nishi stressed that MSX Plus is an enhancement to the present MSX system and that all existing MSX programs are wholly compatible with the new machines.

The higher priced mark two computers will go on sale alongside the cheaper standard MSX models which continue in production. The MSX Plus standard has only been set for the Japanese home market with its 525-line screen display. The export version is still some way off as another video processor chip is required for the export market's 625 line display.

First-comers

The Toshiba HX-23 is one of the first MSX Plus computers to be released on the Japanese home market. The finish is in silver and the styling is similar to that of the Toshiba HX-22 described in earlier editions of East. It has a built-in RS232 bi-directional serial interface, and an extended 48K BASIC in ROM. The HX-23 has 64K of user RAM memory and 128K of video RAM.

New features include a built-in real time clock and calendar which, once set, are continually updated, even when the computer is switched off. It even keeps the day and date right for leap years!

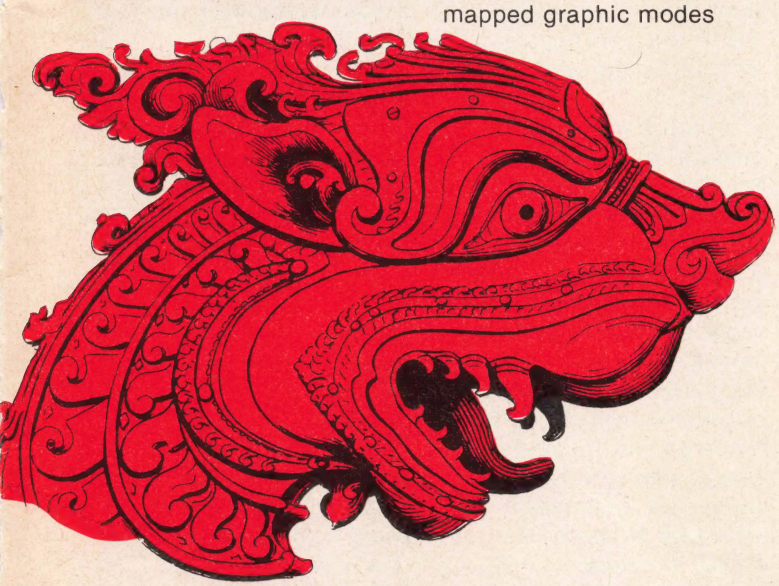
The new Toshiba is being heavily advertised as being suitable for both home and business use, with a great deal of emphasis being put on the two-way communication capabilities. These facilities are suitable for users linking into a new telecomputing service which is called ASCII-Network. This videotext system is being financed by ASCII-Microsoft and is available to micro users completely free of charge.

I spoke to Toshio Terada, the director in charge of all Toshiba MSX projects. He forecasts that the HX-23 will become popular as a low cost videotext terminal. Mr. Terada is already a member of the UK based MSX-Network and he thinks that MSX users will be sending high resolution pictures to each other on a worldwide basis by the end of 1986. Mr. Terada is sure that the digitising feature will appeal to the video enthusiasts and that the HX-23 will sell well even though the cost is double that of a standard MSX computer.

Yamaha have always been to the forefront of MSX developments and have just released a new model, the YIS604/128.

Yamaha's MSX Plus has the full 128K of video memory and is being promoted for its ability to reproduce the full Japanese Katakana and Kanji character sets on the screen displays.

Yamaha have a special word processor program and printer which can be used for fast printing of documents in the Japanese Kanji characters



— this is normally a tedious task on a special 3,000 key typewriter. The 80 characters per line and high resolution on the Yamaha MSX Plus open up a whole new area of business applications for the Yamaha YIS604/128 computer system.

Enhancements

The new Japanese enhanced MSX specification retains the popular Z-80A processor but now has a 48K extended BASIC in ROM. New commands allow easy BASIC programming of a lightpen, track ball, mouse and musical instruments.

The switch on screen mode, colours and volume settings can be stored along with the date and time into a special area of RAM memory which is backed up by an internal battery. As long as the computer is switched on for a few minutes every three months the day and time will be updated automatically.

A completely new video processor chip, the V9938, is used in conjunction with up to 128K of video memory — the present standard MSX has 16K of VRAM. As well as the present four screen modes there are four extra bit-mapped graphic modes with a choice of 512 colours. The present 16 colours are retained but each colour is available in 32 shades.

Screen modes 5 and 8 give a resolution of 256 x 212. Screen modes 6 and 7 give an even higher resolution of 512 x 212 pixels. An optional interface gives a resolution of 512 horizontal by 424 vertical dots.

In screen mode zero the user can select a display with either 40 or 80 characters per line, thus making the new MSX computers suitable for use with a mass of business programs which runs on MSX-DOS. The compatibility with 16-bit MS-DOS files is retained and can now be used properly on the 80-character display.

The present programmable sound generator chip is retained and there is an option of fitting a synthesiser for use with an FM sound source.

Probably the most important enhancement is the way in which the graphics have been improved in definition and speed. The new video processor chip works in parallel with the Z-80 CPU to greatly speed up the drawing of multi-colour high definition pictures. It is now possible to move sprites simultaneously and to superimpose and digitise pictures. Once digitised the pictures can be transmitted from computer to computer via radio, interactive cable TV, or a standard telephone line.

Picture show

On my visit to ASCII-Microsoft, Kay Nishi and his chief engineer, Ryozo Yamashita, showed me the vast amount of development work they had done on MSX Plus. They demonstrated how pictures from a TV or video can be digitised instantly and stored in the video memory of the computer. It is then possible to zoom in on and enlarge particular sections of that picture and store it in the 128K video memory or on to a disk. A second picture can then be digitised and the images moved around so that their size matches that of the first picture. The two pictures can then be recalled from memory and superimposed on top of each other.

Mr. Yamashita selected a still frame picture from a video tape which showed Mr. Nishi, reduced the picture in size and moved him to the left hand side of the screen. A second picture of a young Japanese girl singer was then moved with the digitiser so that she was on the right hand side. The two pictures were then superimposed and with a little more adjustment the picture now showed Mr. Nishi shaking hands with someone he had never met.

In a similar way the MSX Plus micro could be made to digitise a picture of me taken by simply pointing a video camera in my direction and storing the results in memory. My face could then be reduced in size and placed behind the windscreen of a Rolls Royce.

Mr. Nishi was very enthusiastic about these new video facilities, especially as the pictures can be transferred from one MSX computer to another. He forecast that parents would soon be sending MSX pictures of their children to another MSX computer miles away at the grandparents' home. He has already designed the card which he will be sending out this Christmas on his MSX Plus.

Doubling up

Mitsubishi have been showing advance models of their new MSX disk unit model ML-30FD. The first thing you notice is that the free memory is 23415 bytes compared to the 24455 bytes which show when you use a Sony disk unit. The extra bytes are used by Mitsubishi so that their drive is double sided double density, giving 720K of storage on a disk compared to 360K on the Sony.

These new double sided double density drives are expected to go on sale at the end of the year. Mitsubishi also showed a model with two double sided disks giving 1.4 Megabytes of storage on two 3.5 inch disks. These disks will obviously appeal to business users.

Soft Options

The thrills and spills of the latest MSX games as seen by our seasoned experts

BOULDERDASH
Orpheus
£6.95
Cassette

This latest conversion to swell the ranks of MSX software is based on the arcade favourite Mr Do.

Our hero is called Rockford and his aim in life is to burrow through rock-laden ground to collect diamonds. As he burrows under a rock it can fall and crush anything beneath it, which is bad news for Rockford if he happens to be there.

The ground is stratified to form a maze and you may find yourself blocking Rockford's path to a diamond if you are not thinking logically. If all the diamonds cannot be collected then the only way out is the panic button which puts you back to the beginning of whatever level you were on.

Falling masonry is not our hero's only problem. At the higher levels a firefly, a butterfly and an amoeba put in an appearance. Slick joystick work is needed to dodge the little beasts or eliminate them with a well-placed rock.

Contact with the amoeba is not fatal for Rockford but it is for the firefly and the butterfly. If a butterfly collides with the amoeba, the resulting explosion leaves behind a shower of diamonds. The more the amoeba grows the greater the reward, but be warned — it can grow too large and exhaust its energy supply. If this happens it turns into a solid wall of boulders which can block Rockford's path to safety.

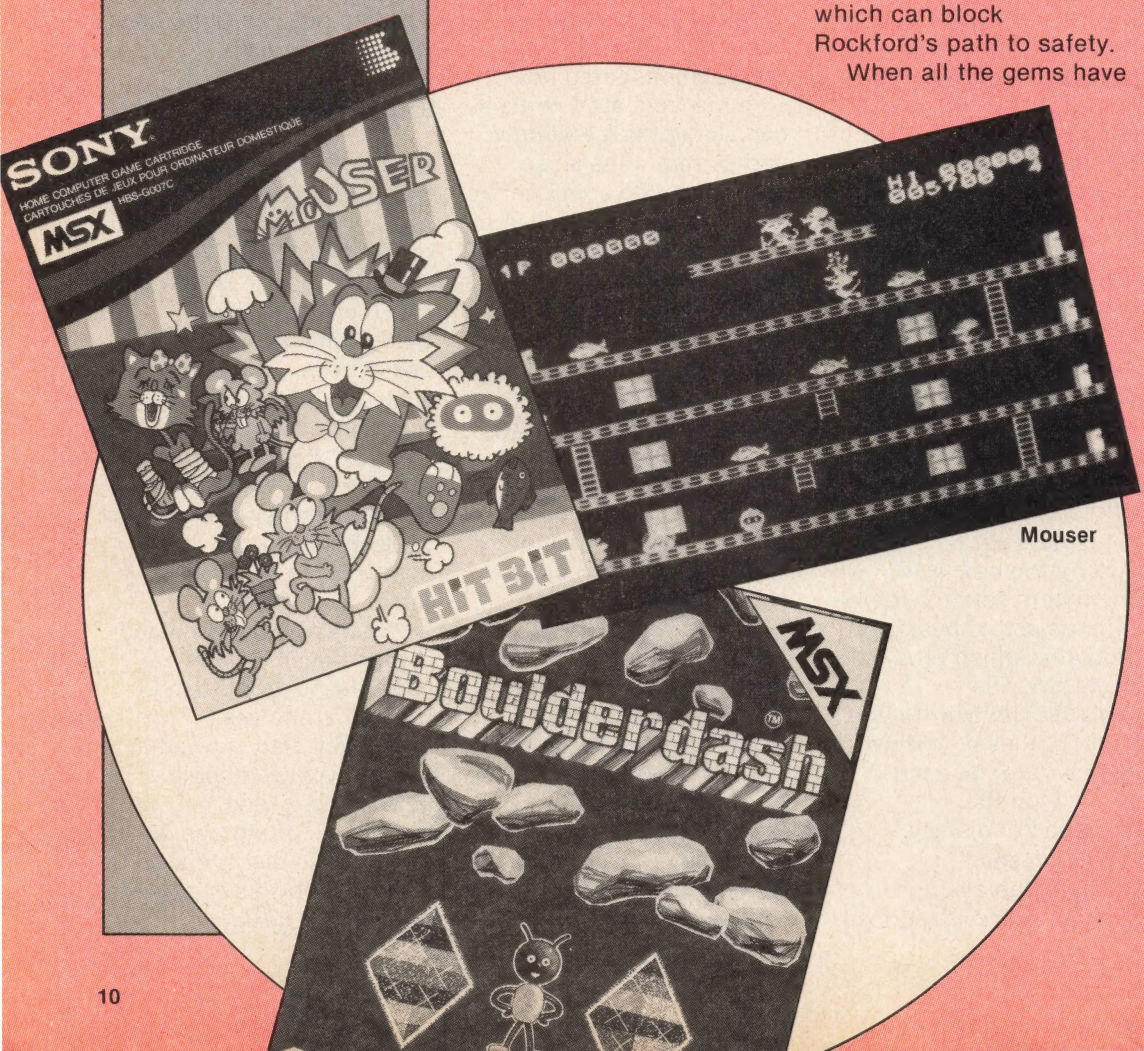
When all the gems have been collected a flashing square must be found which is the entry point to the next level. All this must be done within a given time limit or another of Rockford's three lives will be lost.

The game has 16 mazes in all, divided into four groups which are separated by a bonus screen. The bonus, an extra life, is gained by completing a special screen with a very short time limit.

The graphics are chunky and nicely animated and the sound is also of a high standard. A game worth considering.

ED

8/10



Mouser

MOUSER
Sony
£17.95
Cartridge

Tom Cat has to rescue his girlfriend, Kitty, who is being held on the top floor of a building by some malicious creatures. These creatures are determined to stop Tom by rolling balls and throwing flowerpots at him as he dodges up and down ladders and eats the fish which are strewn around the screen.

The guardian creatures are also careless with their young, who run about aimlessly and are doomed if caught by the cat. The fact that they are rats makes the title of this game something misnomer.

Anyway, once Tom reaches Kitty, to the dulcet pings of the Wedding March, the player commences all over again on the second screen with new problems: wrenches, dynamite, and holes in the floors. After making the exhausted cat run up all the ladders again, another screen is born, and so on.

Mouser is produced by

Minder

Dorodon

Sony, the makers of my own MSX, the Hit Bit. I expected, therefore, the same expertise to be displayed in the game as is in the machine. This was not to be.....but, I'll come to that later.

The positive aspects of the game are many.

I must say how much I enjoyed the sound. There are none of your repeated tuneless ditties here. The accompanying theme is a skilful arrangement of an American melody, and the other incidental effects are also well done — especially the forlorn squeak the little rats make when they are caught by Tom Cat.

All the moving graphics are sprites, the cat-hero being two sprites superimposed to produce his white and ginger coat. The movements of the characters are rather fun and fairly smooth.

Now for my one and only reservation about the game, and it's a serious one. I mentioned that the graphics are sprites. We all know that MSX micros can cope successfully with a maximum of four sprites in a row — more than that and the flickers set in.

We all know this — Sony don't, apparently. At one stage during my game there were eight sprites on one floor (counting Tom as two), and the flicker when that happened was drastic. In fact, I would say that the game was then unplayable — especially as the action was rather hot with so many obstacles and rats around.

This is a bad problem, which occurs more frequently at higher levels. It is a real shame, but the limitations of the video chip waste what would otherwise be the most enjoyable game I've played for a long time.

CJM

6/10

MINDER

DK'Tronics
£9.95
Cassette

Mr. Arthur Daley has two grand, a few assets in his lock-up, and 15 days to trade with the aim of producing as fat a bank balance as possible.

That is the plot of DK'Tronics' **Minder**, based on the Thames TV series. The game involves round the world of Arthur, Terry, the Winchester Club and the shady deal.

As the player you assume the identity of Mr. Daley and make your way using GO and WAIT. After typing G for GO, you decide your destination from a list. Once arrived, a rogues' gallery of faces (all of which looked much the same to me) is displayed so that you can decide to whom you wish to talk. The real business starts with the conversation.

It is up to the player to extract the lowest prices from the sellers and the highest from the buyers so that the Daley bread can be made. This ability only comes with practice.

The time is advanced by one hour by every action the player makes — a journey, a conversation, a wait and so on. If the player gets on the wrong side of someone, the game can advance by days — the period of Arthur's hospitalisation.

This is a game that will require patience to master, and a good memory for keeping track of stocks, prices, movements of dealers and who is who in the rogues's gallery.

Personally, I didn't think the Minder-style slang transfered successfully to the computer. I found that ungrammatical sentences, coloquialisms, snide remarks and insults were incongruous on the screen and irritating after a while.

Minder will probably appeal most to addicts of the original TV program.

CJM

6/10

DORODON

Sony
£17.95
Cartridge

At first glance, this seems like another Pac-man game, but, although there are similarities, I much prefer this.

Dorodon is the hero of the fray and he runs up, down, left and right along the corridors of a grid on the screen. He is chased by gremlins, up to four at a time, who kill him if they catch him.

Dorodon has the chance to fight back if he runs through a 'metamorphic mark', which looked more like a question mark to me, For ten seconds after his metamorphosis Dorodon defenceless self again.

The gremlins are pretty stupid, and can be lured to their deaths in a bonfire if Dorodon hangs around near one. This tactic is dangerous, though, as Dorodon can be roasted into oblivion too.

So far, so familiar.

However, the coloured lines, which I at first assumed were walls as in Pac-man, are revolving doors. They are closed doors to the gremlins, but when Dorodon runs into one it rotates and changes colour.

Besides the meta marks and bonfires being dotted around the joint, there are also a few windmills. If Dorodon walks through a windmill, a wind blows. This gale makes all the red swing doors revolve, bouncing any gremlins within their radii into a prison at the bottom right of the screen. Gremlins not within swinging distance lurk on.

An apple, Dorodon's favorite food, also appears on occasion, which can be a mixed blessing as the gremlins favourite hiding place is behind the apple.

The round ends when all the doors have been turned red. Points are awarded for gremlins eaten, burnt and imprisoned, for meta marks metamorphosed, and for apples consumed.

The graphics in this program are professionally done, as is the sound. Both come up to the high standard of the game-play itself.

Don't worry if you are colour-blind, or use a black and white telly and hence cannot distinguish red from other colours. The red doors are thicker than other doors too.

Sony have produced a fine game in **Dorodon**.

CJM

8/10

JUNO FIRST
Sony
£17.95
Cartridge

I was very disappointed with this game which is copyrighted by Konami, although it is produced by the Sony Corporation. Remembering the excellence of other Konami products, I expected a lot.

Instead, the computer switched on to a familiar zap-the-spacecraft game, to which I soon switched off. There weren't even any good graphics to rave about, just rows of dots. Now I know that when you get down to basics, all computer graphics are just rows of dots, but normally they form a picture of something.

The rows of dots are in perspective and an attempt is made at 3-D graphics. However, I was irritated by the enemy craft being very small until half-way down the screen when they suddenly double in size for the rest of their journey.

The sound is an attempt at being racy, spacy, and ominous and fails on all three counts.

The cursor keys direct the Juno First, the player's ship, left and right, while the space bar fired the 'gas maser'. The facility to speed and slow the enemy attack is offered by the up and down cursors.

If circumstances become too dangerous, the Juno can time warp out for a few seconds until the worst has passed. This function is on the normally useless SELECT key, an arrangement which works fine on the Sony Hit Bit where that key is ideally placed for the thumb of the hand operating the cursors.

I don't think owners of Sanyo or Goldstar MSX micros would find it quite so easy — their SELECT key being at the top of the keyboard out of comfortable reach of cursors and space bar. If the game had been a better one, I would have suggested they buy themselves a joystick. As it is, I don't think it is worth buying the game.

CJM

5/10

CHILLER
Mastertronic
£1.99
Cassette

It is night. A full moon lurks behind a cloud. An open-topped car comes along the road, only for the engine to die.

'We're out of gas', says the driver.....

No, I haven't had a brainstorm and started to review a very famous pop video. This is the scenario of Mastertronic's **Chiller**.

Unlike Michael Jackson's video, the game is inexpensive. The reduction in quality resulting from this is not as great as I feared. In fact, the substance of the game is solid enough.

The player is required to manoeuvre the hero round various screens, collecting all the magic crosses on each level. in the course of doing so, he loses energy due to his activity, and if he collides with any spooks more energy is lost. To ensure that all his strength doesn't disappear, he must nourish himself with mushrooms while avoiding toadstools.

Chiller

After completing several locations, the player reaches the hero's girlfriend, and then has to take both of them back through the ghoulish gauntlet.

For various reasons, I did not find this an enjoyable game. The desperate situations that sometimes arise are more frustrating than exciting, and small details of presentation are not as classy as they might be. Starting a new game is a messy affair. And the demonstration games are poor because the player's character doesn't move.

The sound is extremely irritating. The background theme is the most mindless music I have heard in a long time, and it is repeated without respite. Add the fact that the incidental noises are uninteresting, and I think it is fair to say that the sound does not enhance this game.

In short, an unspectacular product from Mastertronic, but novel enough to keep one amused for a while.

It is all right if what you want is a cheap chill.

CJM

6/10

THE MSX SOFTWARE SPECIALISTS

IF YOU ARE AN MSX
RETAILER PLEASE CONTACT US.

PROFIT FROM OUR EXPERIENCE
AND OUR
24 HOUR DELIVERY SERVICE

WE CARRY A
FULL RANGE OF
MSX
SOFTWARE

EXPORT ENQUIRIES WELCOME

Nemesis Distribution Ltd., 2 Iffley Road, Hammersmith, London W6 0PA. Tel: 01-741 2299

MSX

Second Generation

In his second look at MSX Plus, Karl Dallas examines the tempting possibilities of the new extended BASIC

When official full details of the new extended MSX BASIC are announced, one of the goodies that will immediately attract the attention of the computer graphics fanatics will be the COPY VIDEO command, which will allow the MSX user to 'snatch' a video frame, digitise it, and then put it into an area of screen memory.

Since the capability already exists in non-extended MSX to SAVE an area of memory as a binary file on disk or tape, this means that such frames could be utilised in programs, though judging by the demonstration I've seen of such a snatched video frame being written back to the screen, they might be rather slow.

Also, it will need to be employed on a bit-mapped screen of no less resolution than 256 by 212 pixels. This effectively limits its use to the new SCREEN 8, which requires 128K of dedicated video RAM to be utilised — that is eight times as much as is available within the current versions of MSX, and unlikely to see the light of day until towards the end of 1986.

However, it's nice to dream over the extra facilities that could be available to us by the end of next year. Bear in mind what I said last month about the extended spec opening up *possibilities*, rather than defining the way things *must* be. Judging by the information that has been leaked to me, it is likely that a computer with the entire MSX Plus spec would be much more expensive than most of us would be prepared to pay.

Staying with videos and TV screens for a moment, another command will be SET VIDEO, which will control such factors as whether the output of the computer or an external device (eg a video player) is displayed on the screen, whether the computer signal is superimposed on the video tape, or combined on the screen.

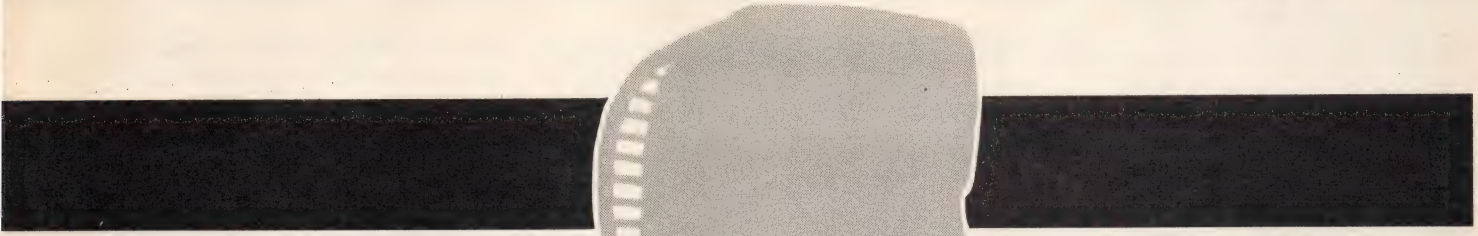
Both these commands need to be used in conjunction with SET PAGE, which is available only with the four new screen modes. This establishes up to four pages within VRAM (only two in modes 7 and 8 or if VRAM is limited to 64K). Pages are numbered 0 to 3.

As business users will already have been excited to learn, for the first time MSX Plus will offer a text screen 80 characters wide.

To get 80-column output, first the text mode must be invoked with the SCREEN 0 command, at present limited to a 40-character screen. Then the command WIDTH must be given with an 80 parameter — or indeed any figure greater than 40, so that WIDTH 41 will also produce an 80-column screen, though only 41 columns of it would be available.

One thing that is still unclear is exactly how the new SCREEN 4, which is described as utilising graphic 3 mode, will differ from the existing SCREEN 3, which is a medium-resolution (64 pixels wide by 48 deep) multi-colour screen for the display of MSX block graphics. The resolution of SCREEN 4 is 256 by 192 and it is bit-mapped, but it appears that it will be possible to mix block graphics with bit-mapped graphics. The new SCREEN 4 mode will also require twice as much (32k) of video RAM as the old SCREEN 3.

The COLOR statement will be made very much more powerful, to allow for the additional colours which are available. The 16



standard colours, numbered from 0 (transparent) to 15 (white) are still available, but this range may be modified by determining the percentage of red, green and blue — the basic colours of the normal TV image — mixed together to produce it. So

COLOR 1 = 2,3,4

will change the black (COLOR 1) to a mixture of red of an intensity of 2 on a scale graded from 0 to 7, a green intensity of 3 on the same scale, and a blue intensity of 4. Only four colours may be redefined in SCREEN 6, but all 16 may be redefined in SCREEN 7.

The 256 colours available on screen at the same time in SCREEN 8 are defined in a similar manner, using the equation

colour = 32 * G + 4 * R + B

Sprite colours may be set with the COLOR SPRITE command, but if multi-coloured sprites are required, the similar but quite distinct COLOR SPRITE$ command must be used, allowing each line of dots of a sprite to be coloured differently from the next and previous lines.

This is a very powerful command, permitting the input of binary values to define what should happen when sprites collide.

The command

COLOR = [NEW]

resets the colour table to its default status.

The COPY command can be used to manipulate areas of video RAM, defined by the X,Y co-ordinates in a similar manner to the existing LINE statement, but this can move a block of the screen display to another location, either on the displayed screen, or on another screen page defined in memory with the SET SCREEN command, into an array variable, or into a disk file.

Under MSX-DOS, which will be available in ROM, there are also very powerful COPY disk commands, similar to those employed in MS-DOS on the IBM. The command

COPY A: * .DOC B:

for instance, will copy all the files with the three-letter descriptor ".DOC" (usually employed for word-processed documents) from the disk in drive A: to drive B: (or in the same drive, if only one is fitted, in which case the user is prompted to change disks when necessary).

Since the new VLSI 'engine' chip in MSX Plus will probably include a battery backed-up calendar and clock, there are a number of commands for setting these, and for their use as alarms.

The user will also be able to change the characteristics of the display on power up with the SET SCREEN command. To do this, the screen mode, width, foreground, background and border colours, function key display, key click, printer mode (eg with or without MSX graphics capability), cassette baud rate, and display mode must have been previously defined with the SCREEN command. It will only be possible to power-up in either of the text modes, but a business user who only used an 80-column screen would be able to make this the default.

Other SET commands will be available to define the screen message on power up. Users will be able to program the computer to ask for a password before the computer can be used, and alter the 'Ok' prompt to anything else the user might prefer, like 'Ready', or even 'Come on buster, I'm waiting for input'.

Another valuable possibility likely to be offered is to set up a RAM 'disk' within the memory area. If the total size of memory permits, this can hold various programs (or the overlays of a complex program like **WordStar**), and thus speed execution.

That is a facility that doesn't exist even on many MS-DOS computers like the IBM (though the Hyperion and Commodore PCs both have it) and, having used it, I can testify to its value.

The RAMdisk is set up with the CALL MEMINI statement, followed by any number between 1023 to 65525, to define the disk area in bytes (65535) is the default). Once it has been defined, the RAMdisk can be accessed in the same way as disk files, except that instead of prefixing them with A: or B:, you have to use MEM:.

A RAMdisk directory can be displayed using CALL MFILES and the commands MKILL and MNAME have to be used to erase or rename files from the RAMdisk.

If I've whetted your appetite for this new, exciting upgrade standard, perhaps I should repeat what I said last month.

These are possibilities, not certainties. It is unlikely that all these facilities and commands will be made available on any but a few, very expensive machines.

The specification is not yet totally finalised — by May this year, they'd got up to version 0.97, and the release version will probably be 1.0, so you can work out for yourself how close they are to finalising things.

Some of these facilities may be put on to cartridges to produce MSX Plus software that will run on standard MSX machines.

The plan is for MSX Plus machines to hit the market-place in the latter part of 1986 — though it is my guess that pressure from eager customers might cause them to revise this schedule somewhat.

One thing that is clear is that the MSX companies (if not the retailers) have decided against bringing the price of their products down to any great extent in the months to come. Instead, they will be offering extra features, at an extra price.

That seems a more productive way forward than a Commodore-style price war, which could only harm the computer world in the long run.

MSX Teach-in

Get to grips with your machine at our special computer weekend.

Think back to the high expectations which led you to buy a computer. For many the major attraction is the potential to write the kind of program which will impress family and friends.

When reality strikes and the hours of head scratching, book reading and burning of midnight oil start to take their toll, the result is the relegation of the computer to more menial tasks. It is reduced to the status of a mere games machine or, for the more creative, its streamlined shape mark it out as an ideal door stop.

If this sounds like a familiar story then weep no more because help is at hand. *MSX User* in conjunction with Ardmore Adventure and Crest Hotels will be running a computer weekend from November 22-24 inclusive. As well as training for those who are just Starting Out with MSX BASIC there will be the opportunity for the more experienced to try out the very latest software and hardware. Our team of instructors will also be there to help you with any problems which may be getting the better of you at the

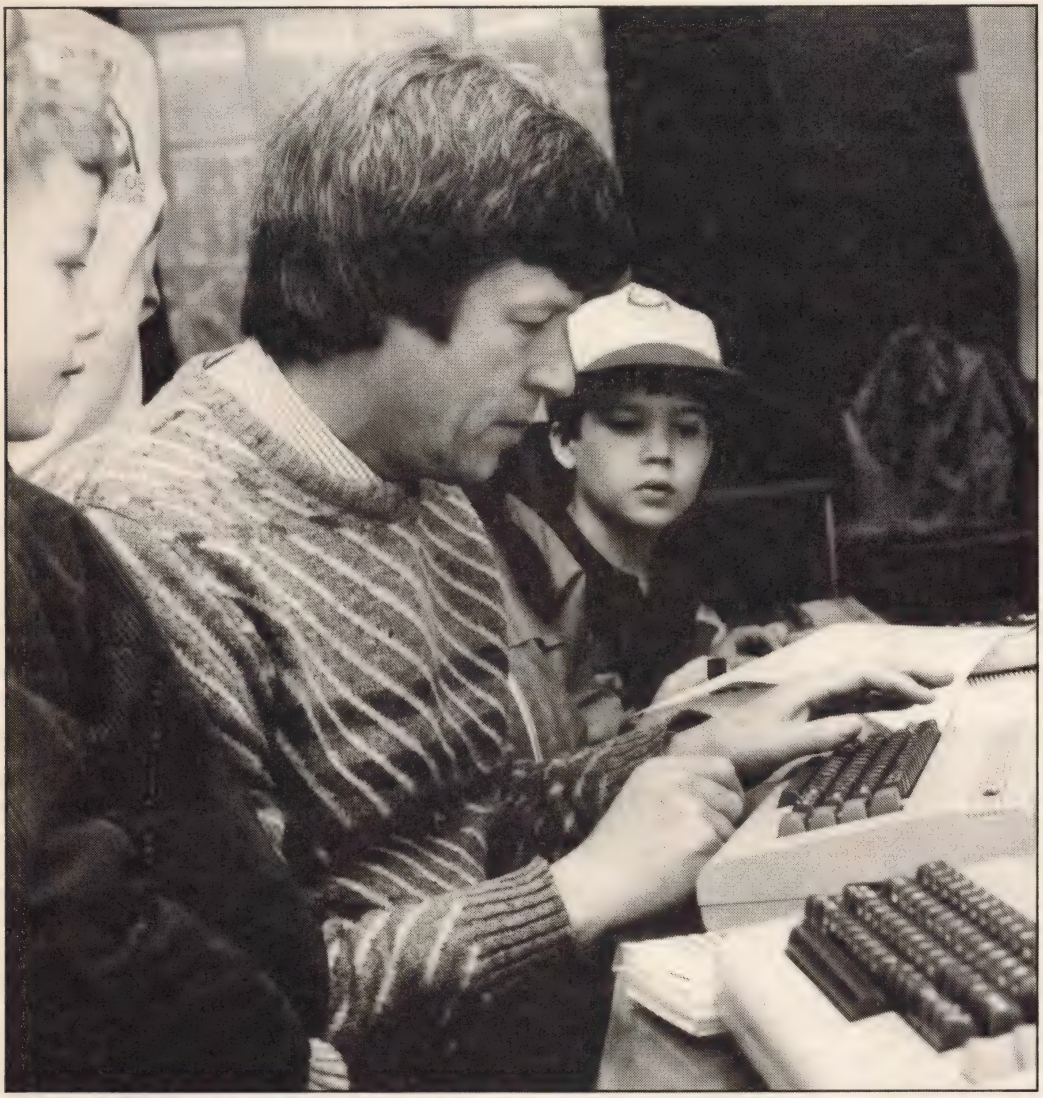
David Walker of Ardmore Adventure is an old hand at organising holidays of this kind. Each summer and Easter his organisation has run adventure camps for school children which include sporting activities along with computer tuition. Talking to parents, David realised that many of them were worried that their children's grasp of computers far outstripped their own. In response to this, he started computer weekends for the whole family.

Ardmore instructor Doug Gregory and pupil

At the MSX weekend gathering, parents and children can indulge in computer training at whatever level they wish. If one or two members of the family do not want to indulge in the delights of computer training, the Hotel has a fully equipped leisure centre to keep them amused.

The luxurious South

Holiday Offer



John Craven at a recent computer weekend

Mimms Crest Hotel near Potters Bar, Hertfordshire, is situated between the A1(M) and M10(M1). The computing facilities ensure that parents can receive tuition in a separate room from their children if they wish.

The weekend will begin with an informal social evening commencing at 8pm which is your chance to discuss your particular needs with the course tutors. There will be about four hours of tuition on both the Saturday and the Sunday, liberally interspersed with breaks and free practice sessions.

Programming sessions will provide tuition in BASIC for beginners, while more advanced programmers can embark upon writing and debugging programs of their own choosing, or learn more about the workings of the MSX.

Applications sessions will consider word processing and business software as well as providing the opportunity to use the latest in MSX hardware such as graphic packages, lightpens and a range of new software.

During the free choice periods, those who wish tc further their knowledge of the computers may do so or you may choose to use the sports facilities or simply relax instead.. Although no formal tuition will be available our tutors will be on hand to give help when necessary.

By arrangement with Crest Hotels the total cost of the course will be £85 per adult. This includes the tuition fee of £30 and two nights evening meals, bed and breakfast. Up to three children may accompany each adult totally free of charge except for meals and they will either share accommodation with their parents in a family room or have a room between themselves (according to availability). A charge of £55 will be made for each adult who does not wish to attend the tutorial sessions.

The emphasis of the weekend is on informality, enjoyment and learning. Judging from past weekends, you will be surprised at how much you can learn.

The weekend also provides an opportunity to air your views about *MSX User* and hear all the latest MSX news from Eric Doyle who will be one of the course tutors. There will also be the opportunity to buy software and possibly hardware at bargain prices, and perhaps to meet an MSX personality or two.

Booking forms and non-refundable deposit of £30 per adult should be sent to Ardmore Adventure Ltd, 23 Ramillies Place, London W1 (Phone 01-439 4461) Further information about the weekend is also available from Ardmore but places are limited so book early to avoid disappointment.

MSX User Computing Weekend November 22-24, 1985.

Name _____

Address _____

_____

_____

Phone _____

Adults ☐ Children ☐

*I enclose payment of £_____

*Please debit my Barclay/Access/American Express card

No _____

I understand that this includes a non-refundable deposit of £30 per adult.

Please send this form to MSX Ardmore Adventure Ltd. 23 Ramillies Place, London W1.

MSX

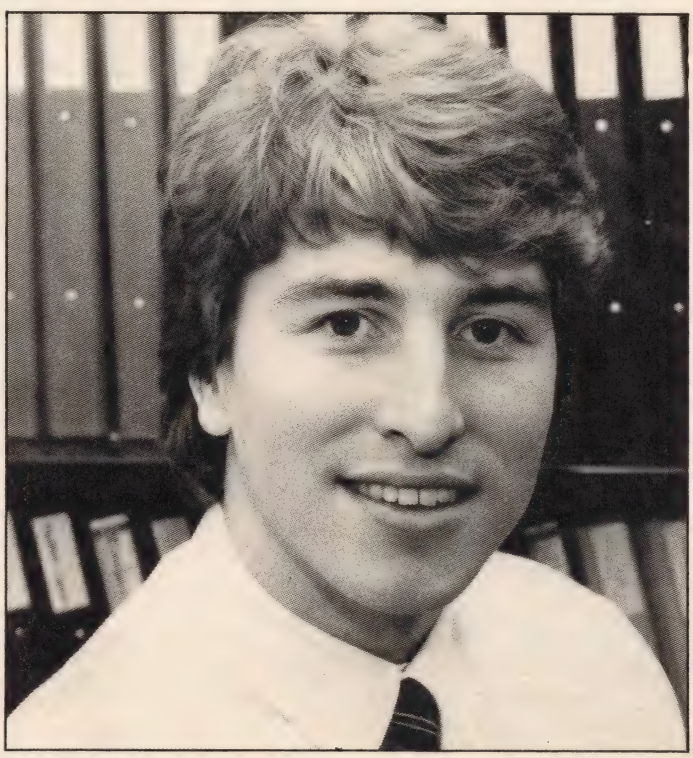
Japanese Connection

Nemesis, leading distributors of MSX software, take a serene view of the market. Eric Doyle reports

The chances are that the software on your local dealers shelf has been supplied by one of the many software distribution companies which have sprung up over the past two or three years. What function does a distributor serve and why do we need them?

I recently paid a visit to a company which has been set up solely to serve the MSX market. Nemesis Distribution is housed in Hammersmith's Iffley Road where I spoke to Craig Thatcher, one of the company's three directors.

Craig explained that software houses prefer to sell their products in bulk, but retailers often only need small quantites for their shelves. The distributor acts as a go-between, taking orders from several retailers and combining them into a bulk order from the originating software manufacturer. The net benefit is a lower price that can be passed on to the end user.



Craig Thatcher

Another benefit is that the dealer does not have to comb the countryside looking for software houses, or spend his days being harangued by reps trying to offload the latest super hi-tech arcade game onto his shelves.

Nemesis was set up in April this year as an independent offshoot of Proteus. Proteus was formed two years ago because its founders realised that a large quantity of educational software was being produced, but that most of the 80 or more existing distributors were concentrating heavily on the games márket. 'The choice proved correct in the long run,' says Craig Thatcher. 'The educational market is steadily growing whereas the bubble has burst for the games market, taking about half the games distributors with it.'

Nemesis are unique in that they only deal in MSX software. I asked Craig the obvious question: why MSX?

'We set up Nemesis on the strength of our confidence in the staying power of MSX,' he answered. 'Here was a computer which, despite initial bad publicity, had enough big names to back it up and help it weather the storm. We're sure that the diverse interests of established Japanese companies mean an extremely secure future for MSX.'

Most of the MSX programs which Nemesis

dealt with in the early days were imports from Japanese companies such as Konami, Kuma and HAL laboratories, with smaller companies being catered for by importers such as Morwood. Konami and Morwood titles still account for the largest proportion of sales. See our chart for the current top selling programs in the Nemesis stable.

It is interesting to note that although the majority of the 200 MSX titles currently available are conversions from other machines, the top two places are held by programs developed specifically for the MSX machines.

But what about the relatively small user base in this country?

'At present we work on the estimate that there are 20-25,000 machines in the UK,' says Craig. 'We hope that price cutting will gradually increase this user base but in the meantime the growth of a worldwide MSX market should mean excellent returns from our export operations. These already account for 25% of our total sales.'

British software houses have built up an excellent international reputation and according to Nemesis MSX looks like being a major vehicle to carry this reputation further. As an example, Thatcher points to Spain which only a year ago was one of the undeveloped computer markets. Already sales of MSX computers in Spain outstrip those in Britain and Craig estimates that a Spanish user base of 200,000 machines is feasible by Christmas 1985.

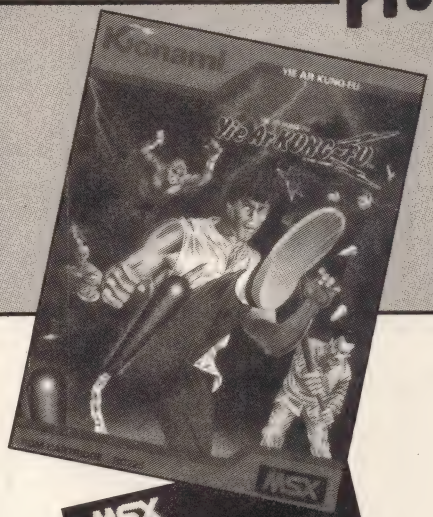
Besides Spain, Nemesis export to Switzerland, Argentina and New Zealand. The company also sets its sights on the rest of Europe, South Africa and Australia.

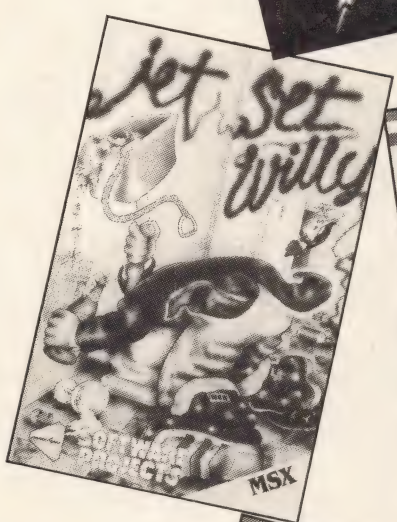
Indirectly, this is good news for British MSX owners who may be feeling depressed at the lack of software in their local shops — a growing world market ensures future software development.

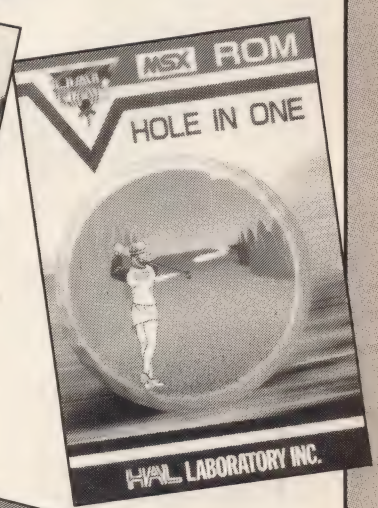
Nemesis are confident that the MSX software market will build up in the UK. Craig Thatcher points out that JVC recently supplied selected dealers with point-of-sale packages which bundled together 30 software titles to support their computer sales. He continues his argument saying: 'JVC's full dealer network covers 2-3000 retailers. Add to this the equally large networks developed by all the other MSX manufacturers and it should not be long before every High Street will have a respectable range of programs for MSX owners.'

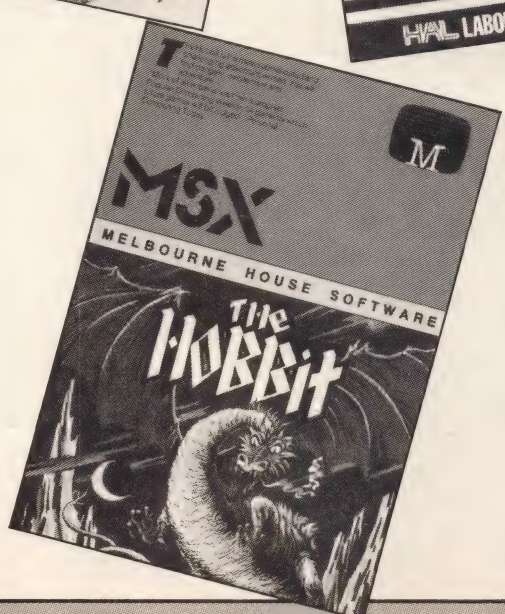
Nemesis Top Five

1 **Yie Ar Kung Fu (Konami)**
2 **Hole In One (Hal Laboratories)**
3 **The Hobbit (Melbourne House)**
4 **Jet Set Willy (Software Projects)**
5 **Le Mans (Electric Software)**





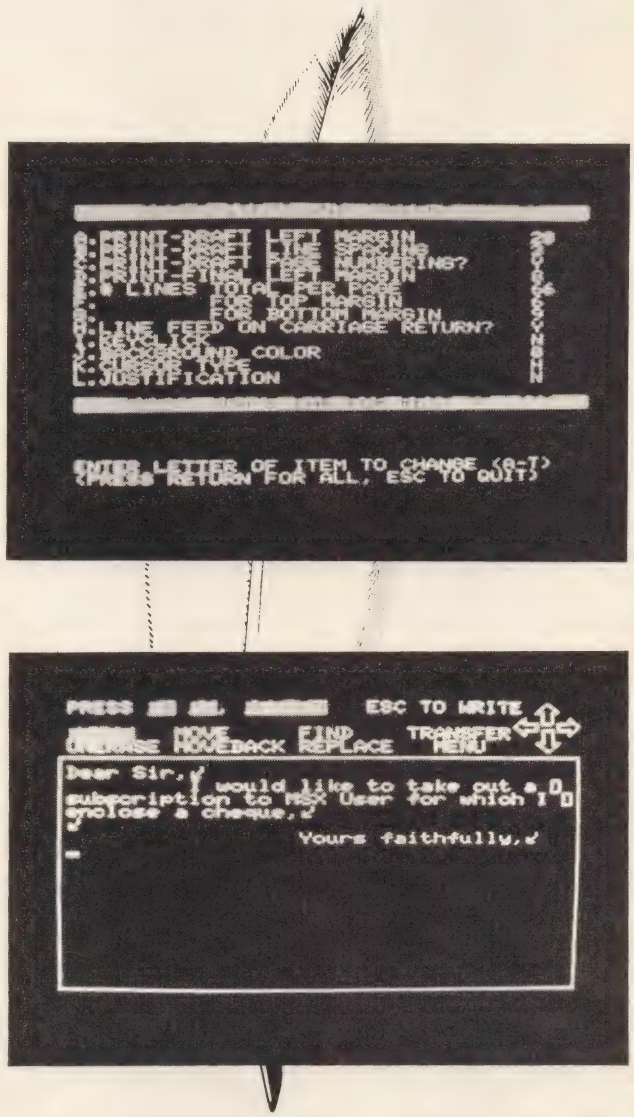




Package Deal

BANK STREET WRITER
Toshiba
£49.95
Cartridge

Karl Dallas puts Toshiba's new ROM and cartridge word processor through its paces



The immediate point of interest about this word processing program is that it will be supplied in ROM firmware within the new Toshiba MSX machine, the HX-22. Due in September-October, this will offer goodies like built-in RS232 socket, RGB output, and stereo sound. So that people who bought their earlier MSX machine should not be disadvantaged by the launch of the upgrade, Toshiba are also making **Bank Street Writer** available as a cartridge.

Bank Street was originally written for the IBM PC, and its emergence on MSX is just another evidence of the growing links between MSX and MS-DOS, the operating system written by Microsoft for the IBM, and the basis for the entire MSX concept.

As a word procesor written for a 'big' machine, the package leaves nothing to be desired in terms of facilities. In fact, it has some which many more powerful (and expensive) WP packages don't offer.

One of these is the command UNERASE, allowing second thoughts after copy has been deleted with the ERASE command.

Actually, it offers *third* thoughts, since it asks the user: ARE YOU SURE YOU WANT TO ERASE HIGHLIGHTED TEXT (Y/N)? after RETURN has been pressed, so this is the first line of defence. UNERASE puts the deleted text back where it was, but just in case *that* was a mistake, it asks: DO YOU WANT THIS ERASED TEXT PUT BACK (Y/N)?

If you answer N, then the correction is uncorrected, and the text stays deleted, unless you again press UNERASE. . . and so on, ad infinitum.

There's a similar protection for the MOVE command, which is complemented by the MOVEBACK command.

Such second thoughts are not possible if any new text has been typed in, however.

On power-up, the machine is ready for typing in copy immediately after the usual MSX opening screen and the publisher's title screen; there's a box allowing the input of 17 lines 30 characters wide.

Text wordwraps — meaning that words are not split at the 38th character, but any words that won't fit are moved to the next line in their entirety. When this is done, a small square is inserted in the last position. However, there is no way of seeing on screen how text will look when printed out — achieved on some

other processors by scrolling sideways past the test 'window'.

Another thing that users of other word processors will find it hard to adjust to is that you can't use the cursor keys while you are in the WRITE OR CORRECT mode. You have to press ESC, which also displays the menu. Also, I couldn't find any way of turning off INSERT mode, so that everything I wanted to type over previous text pushed the old text along in front of it which had then to be deleted using the DEL or BS keys (or the menu command, ERASE).

Pressing ESC produces a menu with the following options: ERASE, MOVE, FIND, TRANSFER, UNERASE, MOVEBACK, REPLACE, MENU.

Movement between the menu options is by use of the F1 key (to go back) and the F2 key (to go to the next option), pressing RETURN when you've found the one you want. Pressing F1 at the last option returns you to the first option.

FIND and REPLACE work neatly. Wherever you are in a document, they search for occurences of the word specified, starting with the very beginning, and each time a word is found, the user is prompted to say whether a further search is required. With REPLACE, the specified word is highlighted and the prompt asks: OK TO CHANGE HIGHLIGHTED TEXT TO "*new word*" (Y/N)?

If the answer is N, it will highlight the next occurrence, until it displays the message: NO OTHER OCCURRENCES OF THAT WORD PRESS RETURN.

There is no way of specifying a global search and replace (ie, change all occurrences automatically), which could be useful when you discover that you have left the final e off Mrs Browne's name throughout a long document. Nor is there any UNREPLACE option.

Disk or tape LOAD (here called RETRIEVE) and SAVE, as well as PRINT options and CLEAR (to scrub all text) are all operated from the TRANSFER MENU.

Disk and tape operations can be password protected, so that unauthorised people can't get access to confidential files (is anyone so paranoid that they use this kind of option on a home computer?). If there is text in memory and a new file is RETRIEVED, then the new text is inserted at the cursor position, pushing any earlier text to after the new file. On SAVE or RETRIEVE, the user is offered a disk directory to assist the memory in the names of previous files.

Other disk options are RENAME and DELETE (not operative on tape files) and from this menu the user can also choose two print options, PRINT-DRAFT and PRINT-FINAL.

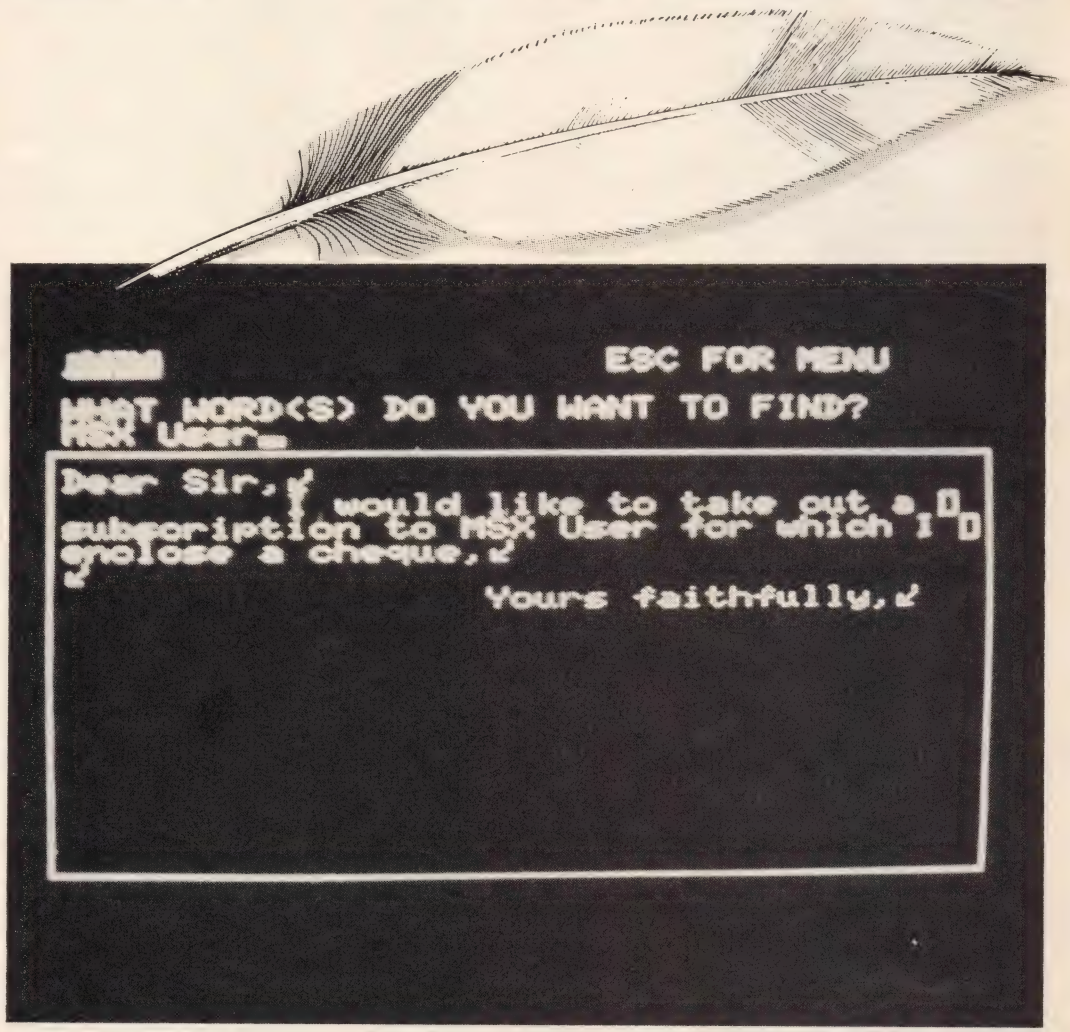
The other option from this menu is UTLTY which offers 20 set-up options — left margin, line spacing, etc — which can all be changed. The default for draft printing, for instance is triple-line spacing, a left margin of 20 and page numbers at the bottom of each but all these parameters can be changed.

From this menu it is also possible to turn justification on or off, change screen colour to black or light blue, turn keyclick on or off and change the cursor shape. If the printer in use recognises a form-feed character, this can be defined, and rendered operative.

There are no facilities for underlining or emboldening.

Conclusions

The Bank Street Writer is a powerful text utility with some remarkably powerful commands — but also one or two surprising omissions. It is very easy to use: this review was written without the aid of any printed documentation, so you can see that the menus are totally self-explanatory. The price is reasonably competitive and it will not confine its appeal to either disk or tape users, but can be bought by someone using tape who might want to upgrade later.


ESC FOR MENU
WHAT WORD(S) DO YOU WANT TO FIND?
Dear Sir,
I would like to take out a
subscription to MSX User for which I
enclose a cheque,
Yours faithfully,

MSX

Grand Design

Bob Maunder begins a new series to help you write programs that work first time.

It may be just a little optimistic to claim that every program should work first time but it is a goal we can aim at.

Many hundreds of man-years of effort have been spent over the past couple of decades of computing in working out the best way to write programs. And yet most of us get an idea and immediately start bashing keys in a burst of mis-directed enthusiasm. Hours, days or perhaps weeks later we are still searching for that last little bug that is clogging up the program.

The new and better way is that of top-down design and it is this gospel that we will be spreading over the next few weeks. We will discover how a little effort at the early stages can pay tremendous dividends later in drastically reducing debugging time and in producing a readable program that is easy to modify if necessary.

We will in subsequent episodes be designing and implementing an MSX graphics package which will provide facilities for drawing and adjusting pictures. We will see how to plan the features for this program and then implement them in a structured manner. We will also examine how the MSX micro can assist us in our program development by means of tracing, error-trapping and debugging features. But first we will submit ourselves to the discipline of some theory of program design.

Now our main aim in programming is to produce a program that works, but since most programs need to be developed and maintained, we also want a program with a clear structure.

Back in the mid-1960s, two computer scientists named Bohm and Jacopini demonstrated theoretically that only three types of constructs are needed to control a program: sequencing, looping, and selection. Sequencing is the normal execution of one instruction after another. Looping is the repetition of a group of statements and can be accomplished with instructions like FOR and NEXT. Selection is a choice between one or more options, such as is provided by the MSX IF-THEN-ELSE statement.

According to the theory, all program flow can be controlled entirely without the use of the GOTO statement. The attempt to do so is called GOTO-less programming. It has been shown that programs written in a GOTO-less programming style are generally much easier to read, easier to correct and improve, and less prone to error in the first place.

Liberal use of GOTOs often produces something called spaghetti code. This is a very graphic term that compares the jumps around a program to strands of spaghetti in a very tangled heap. Spaghetti code can be disastrous. In small programs it can be annoying to keep track of all the GOTOs. In a large program, it can actually become impossible.

Spaghetti code is also very difficult to modify once it has been written. A myriad of GOTO statements may be comprehensible while writing a program, but if the programmer comes back to it in a couple of months, it may have become impossible to decipher.

Finally, if a program does not function correctly, an attempt must be made to find the part of the program where the error has taken place. If there is a GOTO statement that transfers control of the program to the wrong place, it can be extremely difficult to track down.

For this reason, since Bohm and Jacopini, there have been several attempts to create programming languages that do not even include the GOTO statement. Pascal was an early step in this direction.

Such attempts, however, are controversial. While it is true that the GOTO statement is never necessary, it is often not only convenient but also logically correct. For example, as a means of exiting from the middle of a loop during its execution, the GOTO statement is quick, simple, and direct.

MSX BASIC, of course, does include GOTO like all BASIC dialects. It does not provide as many structured statements as some BASICs, but it is still possible to produce a structured program. The only iterative construct is FOR-NEXT.

Regrettably more elegant features such as REPEAT-UNTIL and WHILE-DO are missing. However the use of subroutines is perhaps one of the simplest ways of obtaining a tidy layout of code, and the GOSUB and RETURN instructions handle this. Finally the IF-THEN-ELSE instruction is more than adequate for selections.

Now we obviously have

to do a lot of planning before we get down to using BASIC. Most planners, whether in computing or other fields, tend to use diagrams or charts to illustrate their ideas.

Three types of charts can help the program designer, namely program flowcharts, system flowcharts and hierarchy charts. These were used in the ON FILE series which we completed last month, in describing how the different routines were planned and implemented. Let us look at an example of each to remind ourselves.

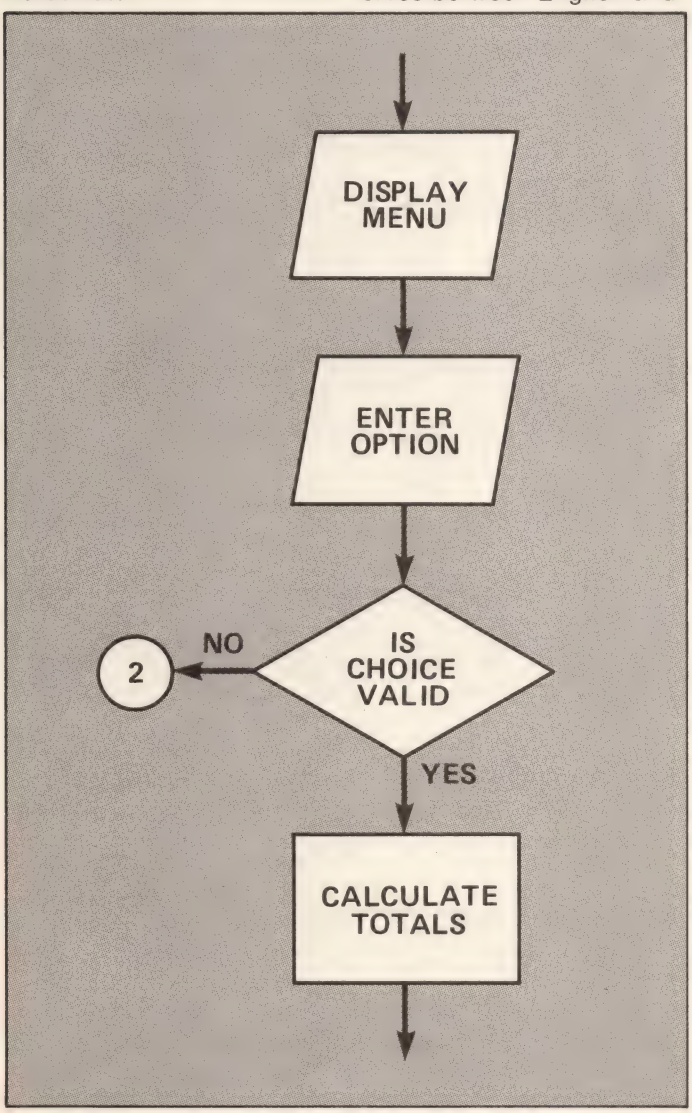


Figure 1

Figure 1 shows a section from a program flowchart. The idea of these diagrams is to show the sequential flow of a program, or its logical steps. Each box represents a step, and can be some process (a rectangle), decision or condition (a diamond), input or output (parallelogram), or connector (a circle).

Boxes are linked by arrowed lines to show the direction of logic flow. These flowcharts have been out of vogue for a while — many programmers prefer to show the program logic by means of a set of numbered steps written in pseudo-code. Pseudo-code as its name suggests is a cross between English and the programming language — pidgin-BASIC if you prefer.

System flowcharts tend to be used in large-scale computing to show the different peripherals and processes in a full system, rather than an individual program. Again different symbols are used to illustrate different concepts, as shown in the example in **figure 2.** Here we have a single program which takes input from the keyboard and also from tape, and sends results to the screen (the symbol is meant to be the shape of a cathode ray tube) and a printer.

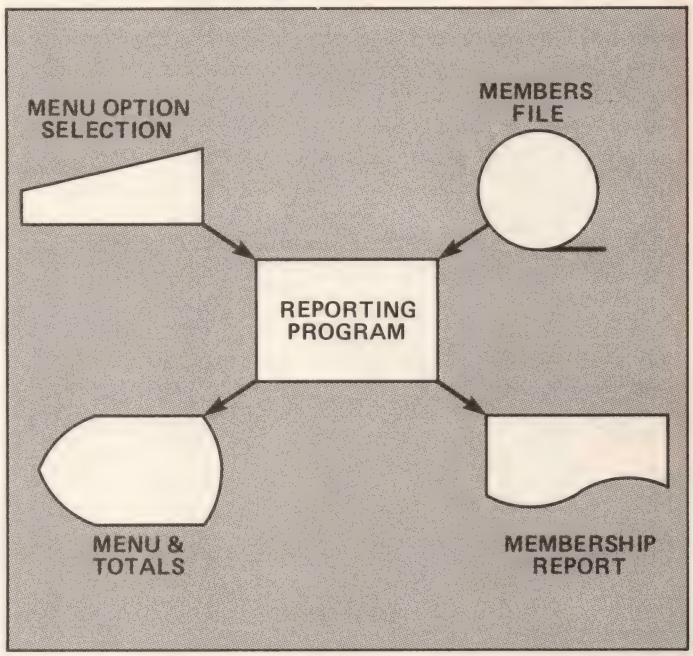


Figure 2

Hierarchy charts are probably the most handy of the three types. They are fundamental to top-down design, and we will now look at them in detail to discover how they can aid us to produce a structured program.

Top-down is the opposite of bottom-up — now there's a profound statement to start upon. Most novice programmers start writing the easy bits of a program, and generally try and build these bits together into a working system. This is the bottom-up approach, and although it means that the programmer can start key-bashing quickly, it can result in some horrendous compromises and fiddles in the last stages to try and get the program to work.

Top-down design emphasises the need to plan out the general features of the program in advance, and then work from these generalities downwards, gradually filling in more and more detail. This can be compared to an artist who sketches out a vague outline of his picture first and then builds up lines and colours to eventually give a complete painting.

A hierarchy chart illustrates this top-down design, by having top-level modules which describe the main functions of the program and are subsequently split into lower level modules.

The chart shown in **figure 3** shows part of the On File system. The 'Print Reports' routine is split into 'Check Records Present' and dissected into smaller components as shown. Now the top level module in this figure will itself be part of a set of routines which make up the full system.

The very fact that we work from the top downwards means that we

do not concern ourselves with the intricacies of low-level routines for a while. Instead we use program stubs. A stub is simply a couple of lines of code to stand for what will be a substantial subroutine — typically it will just print out the name of the routine and then exit. Its purpose is simply to demonstrate that a higher level routine is working properly.

For example we may decide that the 'Check Records Present' routine in figure 3 can be left until later in our program development. In this case we might code a stub for it as:

```
3450 REM Stub for CHECK
RECORDS PRESENT
3460 PRINT "Routine
CHECK RECORDS
PRESENT"
3470 RETURN
```

Obviously this will eventually be replaced by the appropriate detailed set of statements, but in the meantime it will enable us to carry on with our design and development of other routines.

With this approach we are always dealing with a complete system. There is a constant integration of functions as the program develops. Sometimes stubs have to generate data which higher level modules need, and in this case it may seem pointless since the coding will eventually just be discarded. However the overall benefits outweigh this slight disadvantage.

Some readers may find hierarchy charts difficult to grasp, because they do not show program logic as does a program flowchart. The lines joining module boxes do not show sequence of execution but rather the flow of control between routines. The 'Select and Print' routine is called by means of a GOSUB line in the 'Print Reports' routine, and it must therefore return to its calling routine as well.

Yet another analogy might help to clarify the concept. A hierarchy chart is really quite similar to an organisation chart that you might find in a company. Here the top level would be the manager, who then has several team leaders under him at the second level. A team leader may have a number of section leaders for whom he is responsible, and so on down the structure. It would not be effective to have everyone in the department responsible directly to the manager. Instead everyone reports back to their immediate boss. The same principles apply in a program designed by top-down methods.

Clearly there is no single solution to the problem of designing a hierarchy chart for a program — different programmers may adopt different designs. However it is best to keep the function of modules, or branches in the chart, as separate as possible. This aids the development and testing process considerably.

Similarly there is no best approach to deciding in which order to code the modules once the hierarchy chart has been drawn. One approach is to do them in hierarchical order, as they are shown in the chart, and this has distinct advantages. Another method is to do them in order of execution. The second approach can be best when it looks like a program stub needs to be quite complicated in order to produce data to be used by a higher level module. If modules are coded in the order that they will be executed then this situation will be avoided.

No doubt many readers will view all of this as a lot of ivory tower theory with little practical application to programming the MSX micro. Never fear! The best way of being converted to top-down methods is to see them in use, and this is what we will do over the next few episodes of this series, as we develop a full-blown MSX Graphics Package.

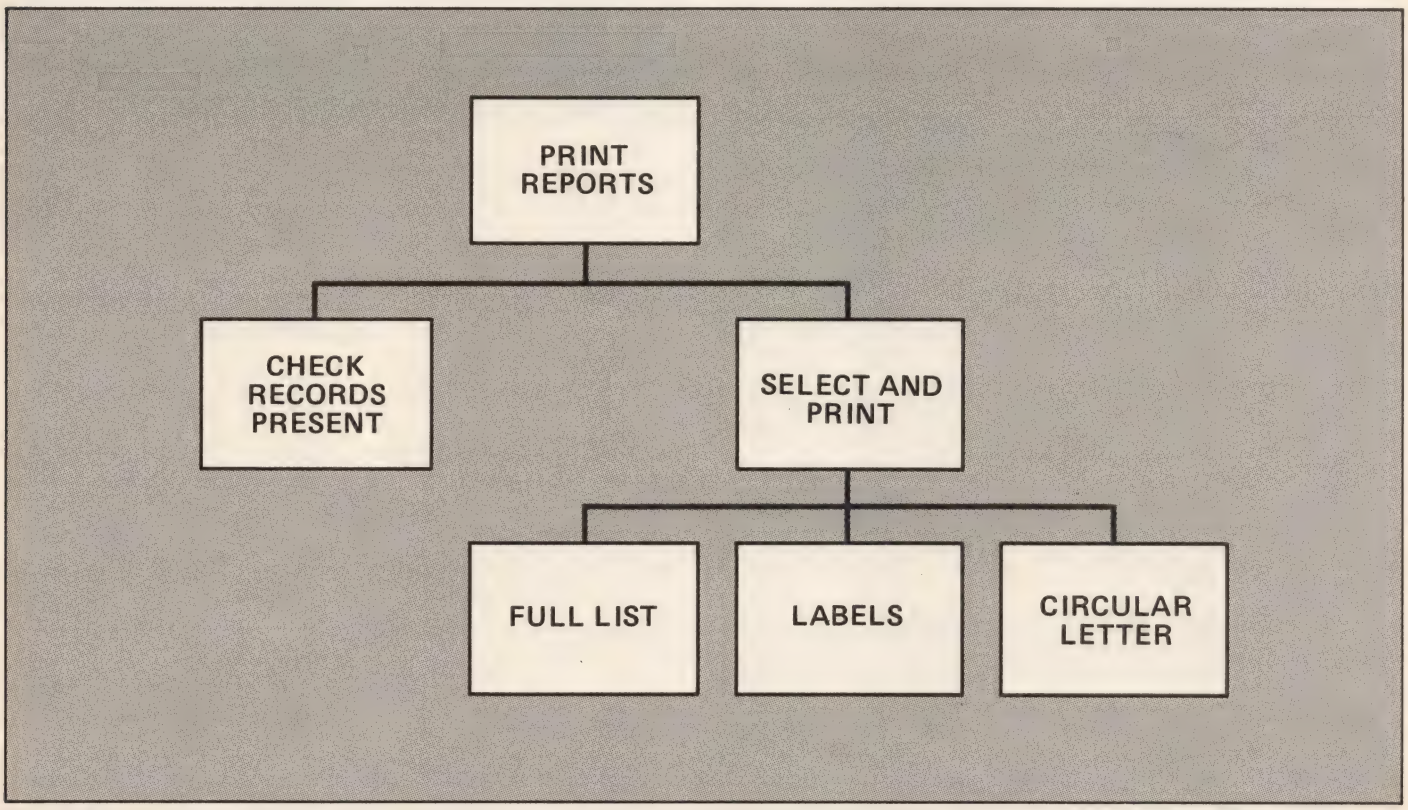


Figure 3

MSX

Win a Mitsubishi

Competition

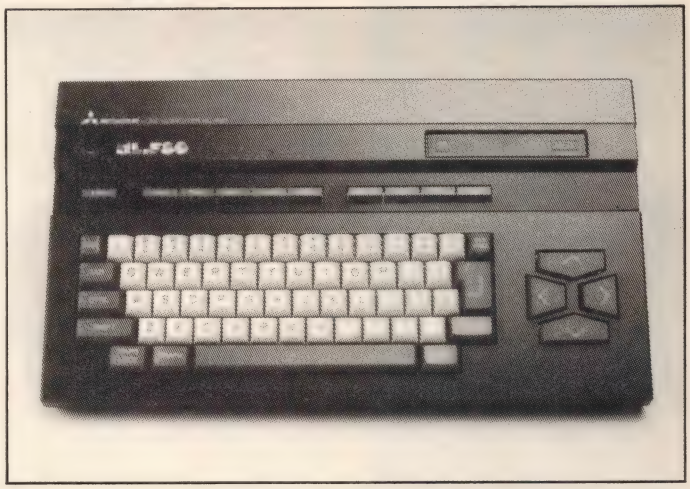
To celebrate the launch of their latest game, **The Wreck** — previewed in our June issue — Electric Software are offering *MSX User* readers the chance to win some superb prizes.

All you have to do is to answer five simple questions about wrecks. The first correct entry drawn out of a hat gets a brand new Mitsubishi ML-F80, worth £279. Electric Software are also offering 100 runner up prizes of the game itself, each selling at £14.95 in the shops.

The Wreck is a cartridge-based undersea adventure which should give you months of entertainment as you dive deeper into the ship's three mazes looking for the master safe which holds a king's ransom in gold bullion. On your way you will feel the sting of the guardian jellyfish and wonder if your oxygen will last as you try to find your way out the maze. Even after you have located the gold, your troubles are not over — watch out for the alien lurking in the shadows.

So to join in the fun, perhaps even win a new computer, set to work and answer the following questions:

1 Where was the wreck of the Great Western found before she was moved to Bristol?
2 Who designed the Great Western?
3 The remains of a massive Spanish invasion fleet lies off our shores. What was its name?
4 Where does the wreck of the Graf Spee lie?
5 What is the name for the sea-borne wreckage from a ship?



Answer five simple questions and a fabulous computer or a great undersea adventure could be yours

Send your answers with the token from the corner of this page to MSX User (Electric), Argus Specialist Publications, 1 Golden Square, London W1R 3AB.

Remember we can only accept entries which are legible, contain your name and address and are accompanied by a token (one per entry). No correspondence will be entered into and the decision of the editor and Electric Software will be final.

This competition excludes all employees, and their families, of Argus Specialist Publications and Electric Software or their distributors and agents.

The closing date of the competition will be first post on September 30th 1985.

THE WRECK

MSX TOKEN

Flat Spin

When is a disk drive not a disk drive? Karl Dallas solves the riddle of the Triton Quick-Disk

If the high price of MSX disk drives so far has deterred you from leaving the slowness and unreliability of cassettes behind you, then seek no more. Rescue is at hand, at less than half the price of the solid but pricey Sony 3½in drive. And it comes with a built-in utility for copying cassettes to disk, so you can store all your favourite shoot-em-ups for almost instant loading.

The answer to every MSX owner's prayer is the Quick-Disk, a 2.8in format originated in Japan by Mitsumi. Now Radofin, the company who bought up all the stocks of the Aquarius micro when the manufacturers went bust, have had them manufactured under licence in Hong-Kong, and the first ones should be trickling on to the market about the time you read this.

At just under £120, and with disks costing only £1.99 (again, that's half the cost of the Sony disks, and almost as cheap as the 5¼in disk size preferred by Sanyo), it has to be an essential buy. So far, no software companies have announced plans to produce games or other programs on Quick-Disk, but it can only be a matter of time, especially since the format is also available for two other popular micros, the ZX Spectrum and the Commodore 64.

The QD (as we shall call it from now on) is about the size of a medium-quality cassette recorder, with an interface that plugs into the cartridge slot of the computer. It also needs to be connected to the mains.

You are told to turn on the QD before you turn on the computer, and of course you already knew that you should never fit anything into the cartridge without turning off the power.

The disks measure 2.8in, and they are rather more flimsy than the well-protected Sony disks. They are flip-over, each side holding 50k of programs or data files. Before it can be used, each side of the disk must be formatted, with the CALL FORMAT command (as with MSX-DOS, the underline symbol "_", can be used instead of CALL).

Every disk command must be preceded with either CALL or "_", and these are not the same as those used by MSX Disk BASIC, or MSX-DOS, which is a pity.

They are:

_D1/_D2 — to select a different disk drive, if more than one is fitted.

_AUTORUN("program") — make program self-booting

_COPY — copy disk to disk

_DIR — obtain disk directory

_FKEY — switch T-DOS function key assignments on/off

_FORMAT — to format a disk

_KILL("*filename*") — to delete a program or data file from disk

_LOAD("*program*") — to LOAD a BASIC or machine-code program

_QDDIR — display directory in QD format

_QDLOAD("*program*") — LOAD program in QD format

_RENAME("*oldname*", "*newname*") — to rename a program or file

_RUN("*program*") — to LOAD a BASIC or machine-code program and execute it

_SAVE("*program*") — to SAVE a BASIC program

_WRITE("*filename*") — to SAVE a machine-code program or data file

Most of these are self-explanatory, but the LOAD, SAVE, WRITE and QLOAD commands have a number of possible parameters which extend the capabilities and flexibility of the system. For instance, it is possible to SAVE and LOAD screen displays, and to WRITE and LOAD data arrays, without going through the tedious business of WRITEing each element of the array to disk one at a time. Unfortunately, there is no random-access facility, so the size of data files is limited by the amount of memory in the machine after the relevant program has already been LOADed.

The _DIR command displays some useful information about everything on the disk: not only their names and length, but also whether they are BASIC or machine-code (B or M) or a

TRITON QUICK-DISK
Radofin
£119.95

screen dump (S). An arrow mark (">") is placed by any program which has been SAVEd with the __AUTORUN command, which means that if this disk is in the drive when the equipment is switched on, then this program will LOAD and RUN automatically. The length of each program or file is given in bytes and the directory also tells you how many of the 512000 bytes in each side are left.

As with MSX Disk BASIC, you have to specify the start address and end address of machine code programs when using the __WRITE command. The execution address may also be specified, but if this is left out, then it is executed at the start addess. When LOADed, an offset address may also be specified to prevent it from overwriting anything already in memory. This is particularly useful when WRITEing and LOADing data files.

Screen displays can be saved with the command

__WRITE("*screen*", &HO,&H3FFF,S)

The last letter indicates a screen WRITE. The hexadecimal start and end addresses quoted are those for 16k of screen data, which is the maximum possible in MSX. If less of the screen is to be saved, then the address parameters may be changed.

To get the screen back, the following command is needed:

__LOAD("*screen*",S)

This command can be used in a program.

Using the __LOAD command with a data file will be appreciated by those who find reading them into an array a tedious business. Reading data from a sequential file can be accomplished with the simple command:

__LOAD "ADDRESS"

As with MSX Disk BASIC and MSX-DOS, it is possible to COPY disks with one drive. The system tells you when to swap disks.

The __FKEY command is a toggle, which switches in a new set of function key definitions, so that F1 now prints __RUN(, F2 prints __LOAD(, F8 prints __SAVE(, F9 prints __WRITE(and F10 prints __DIR. F7 is always programmed to print the __FKEY toggle.

The two commands preceded with QD are presumably to be used with commercial software prepared in what is known as the MSX-QD format. The difference between QD and T-DOS, which comes with the Quick-Disk, seems to be a bit like the difference between MSX Disk BASIC and MSX-DOS. The main difference to the user, when such programs become available, is that MSX-QD supports filenames extensions (eg ".BAS") and that it distinguishes between data files and machine code programs.

Conclusions

The Quick-Disk is not the Mickey Mouse gadget its price may lead you to suspect. It is a serious storage medium, and its speed leaves cassettes standing. Users who want to copy their games cassettes on to disk may find themselves frustrated by the protection built into them, but the real break-through will come when the software companies actually start releasing games and other programs in this format.

The lack of random access may hinder its development as a business tool, but it is certainly a more sensible medium than Clive Sinclair's microdrive.

In short, I like it.

MSX

Numbers Crossword

The game is a race against time. Work out the clues, complete the crossword and win. If you do it in much under 1 minute, 30 seconds you are brilliant.

This program from Ken Goodman of Colchester produces a crossword puzzle in which the answers are numbers. The clues embrace the four arithmetical functions of add, subtract, multiply and divide and can be selected in any order by the player.

The answers are automatically inserted into the correct spaces when the digits are typed. Wrong answers are indicated when all the clues have been completed and, on correct completion of the puzzle, the total time taken is displayed.

When designing this type of program it is necessary to ensure that the crossing-point digit is common to both answers and the puzzle must generate a new set of clues on each new run. It is also necessary to avoid having to write a separate display routine for each clue by keeping track of all relevant information by means of dimensioned arrays.

Such information must include the X and Y co-ordinates, whether the clue is *across* or *down*, the length of the answer, its value and whether the clue has been successfully dealt with. Since the sum has also to be printed on the screen we need to know the individual numbers and the sign with which they are connected. These arrays are dimensioned at line 90 and are loaded in lines 100 to 150.

Main variables

WA	**wrong answer flag**
EN	**end of game flag**
FL(n)	**correct answer flag**
XX(n),YY(n)	**co-ordinates of answer locations**
AD$(n)	**across or down answers**
LE(n)	**length of answer**
N1(n),N2(n)	**sum numbers**
TY(n)	**add, subtract, multiply or divide**
CA(n)	**correct answers**
FX(n),FY(n)	**co-ordinates for solid blocks**
PA	**player's answer**
CN	**current clue number**
XT,YT	**co-ordinates for printing digits**
T1	**final time**
LT	**lowest time.**

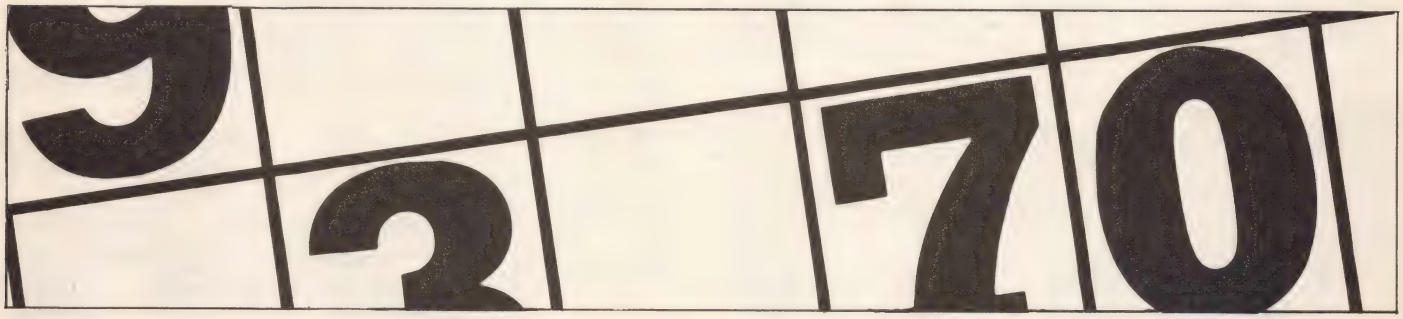
Program breakdown

10-60	title
70-160	initialise variables
170-260	instructions
270-370	draw grid
380-530	choose clue and get answer
540-570	check for valid number
580-670	write number onto grid
680-730	test for game end and wrong answers
740-770	get next input
780-850	end game routine
860-1520	calculate and store clues
1530-1580	update clock
1590-1650	invalid number
1660-1690	place digit in grid
1700-1750	set flags
1760-1790	erase
1800-1980	all OK — game over
1990-2060	DATA for start values

```
1 '        NUMBERS CROSSWORD
2 '
3 '          By Ken Goodman
4 '
5 '
6 '
10 'Heading
20 '
30 COLOR15,1,1:SCREEN2:OPEN"GRP:"AS#1
:KEYOFF
40 LINE(46,34)-(192,118),15,B:LINE(50
,38)-(188,114),7,B
50 COLOR13:PRESET(96,56):PRINT#1,"MAT
HS":PRESET(80,72):PRINT#1,"CROSSWORD"
60 '
70 'Set starting values
80 '
90 DEFINTA-Z:EN=0:WA=0:DIM FL(12),XX(
12),YY(12),AD$(12),LE(12),N1(12),N2(1
2),TY(12),CA(12),FX(13),FY(13)
100 FOR I=1 TO 12:READ R:XX(I)=R:NEXT
110 FOR I=1 TO 12:READ R:YY(I)=R:NEXT
120 FOR I=1 TO 12:READ R$:AD$(I)=R$:N
EXT
130 FOR I=1 TO 12:READ R:LE(I)=R:NEXT
140 FOR I=1 TO 12:READ R:TY(I)=R:NEXT
150 FOR I=1 TO 13:READ R1,R2:FX(I)=R1
:FY(I)=R2:NEXT
160 '
170 'Instructions
180 '
190 FOR DL=1 TO 3000:NEXT:COLOR 7:SCR
EEN 0
```

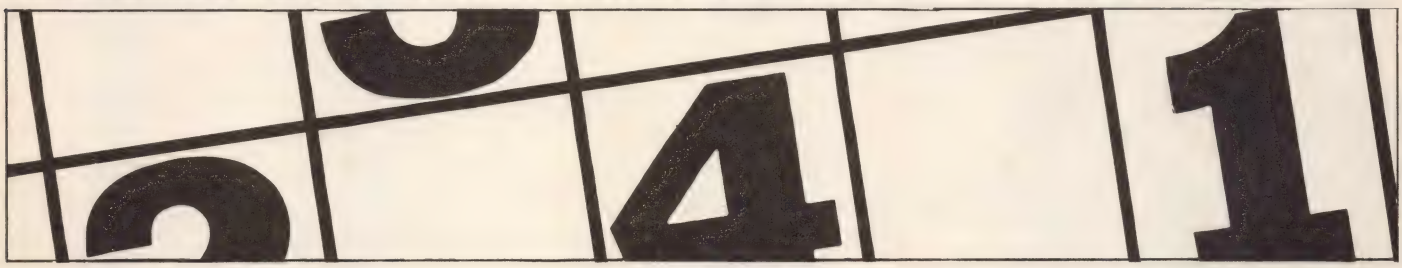
```
200 LOCATE3,3:PRINT"In this puzzle th
e clues are sums":PRINT:PRINT"and the
 answers are numbers. Type in"
210 PRINT:PRINT"your answers and they
 will be put in":PRINT:PRINT"he right
 squares."
220 PRINT:PRINT:PRINT"If you make a m
istake, you can alter":PRINT:PRINT"an
 entry by asking for the clue again":
230 GOSUB 880:REM Set the sums
240 LOCATE 13,20:COLOR 7:PRINT "PRESS
 SPACE"
250 IFNOT STRIG(0) THEN 250
260 '
270 'Draw the grid
280 '
290 SCREEN 2:FOR X=12 TO 156 STEP24:L
INE(X,0)-(X,144),11:NEXT
300 FOR Y=0 TO 144 STEP24:LINE(12,Y)-
(156,Y),11:NEXT
310 FOR I=1 TO 13:LINE(FX(I),FY(I))-(
FX(I)+20,FY(I)+20),11,BF:NEXT
320 FOR I=1 TO 12:COLOR 15:PRESET(XX(
I)-8,YY(I)-6):PRINT#1,I:NEXT
330 COLOR 7:PRESET(8,152):PRINT#1,"If
 you want to erase an answer":PRINT#1
," just ask for the clue again"
340 PRINT#1," and type in the new num
ber."
350 PRESET(8,184):COLOR 15:PRINT#1,"T
ime-last entry"
360 TIME=0:GOSUB 1550
370 '
380 'Choose a clue and type in the an
swer
390 '
400 COLOR 15:PRESET(160,0):PRINT#1,"W
HICH CLUE ?":PRESET(160,32):PRINT#1,"
Press SPACE"
410 IF INKEY$<>""THEN 410
420 CN$=""
430 K$=INKEY$:IF K$="" THEN 430
440 CN$=CN$+K$:PRESET(192,16):PRINT#1
,CN$:IF K$<>" "THEN 430
450 CN=VAL(CN$):IF CN<1 OR CN>12 THEN
 BEEP:ZZ=16:GOSUB 1610:GOTO 420
460 ME$="CLUE "+CN$+"IS":PRESET(160,5
6):PRINT#1,ME$
470 IF TY(CN)=43 THEN TY$="PLUS" ELSE
 IF TY(CN)=45 THEN TY$="MINUS" ELSE T
Y$=CHR$(TY(CN))
480 PRESET(152,72):PRINT#1,N1(CN)TY$N
2(CN)
490 COLOR 2:PRESET(176,96):PRINT#1,"A
NSWER ?":PRESET(160,128):PRINT#1,"Pre
ss SPACE"
500 PA$=""
510 K$=INKEY$:IF K$="" THEN 510
520 PA$=PA$+K$:PRESET(184,112):PRINT#
1,PA$:IF K$<>" "THEN 510
530 '
540 'Check for a valid number
550 '
560 PA=VAL(PA$):IF LEN(PA$)-1<>LE(CN)
 THEN BEEP:ZZ=112:GOSUB 1610:GOTO 500
```

```
570 '
580 'Put this in the grid
590 '
600 FL(CN)=0:XT=XX(CN)+8:YT=YY(CN)+4
610 FOR I=1TO LE(CN)
620 COLOR 1:AT$=CHR$(200):GOSUB 1680
630 COLOR 2:AT$=MID$(PA$,I,1):GOSUB 1
680
640 IF AD$(CN)="A" THEN XT=XT+24 ELSE
 YT=YT+24
650 NEXT:IF PA=CA(CN) THEN FL(CN)=-1
ELSE FL(CN)=99
660 GOSUB 1550:REM Update the clock
670 '
680 'Check for end of game and wrong
answers
690 '
700 GOSUB 1720
710 IF EN AND WA THEN GOSUB 1780:GOSU
B 1930:GOSUB 1780:GOTO 400:REM Mistak
es
720 IF EN ANDNOT WA THEN GOSUB 1820:G
OTO 800:REM All OK
730 '
740 'If the grid is not full, go back
 and get another clue
750 '
760 GOSUB 1780:GOTO 400
770 '
780 'Game over. Any more ?
790 '
800 LOCATE 8,18:PRINT"Any more (Y or
N) ?"
810 ZZ$=INKEY$:IF ZZ$="" THEN 810
820 IF ZZ$<>"Y" THEN SCREEN0:END
830 FOR I=1 TO 12:FL(I)=0:CA(I)=0:NEX
T
840 GOTO230
850 '
860 'Clue 1
870 '
880 N1(1)=INT(RND(-TIME)*20)+11:N2(1)
=INT(RND(2)*20)+11
890 CA(1)=N1(1)*N2(1):CA$=STR$(CA(1))
:ZZ$=MID$(CA$,3,1):IFZZ$="0" THEN 880
900 '
910 'Clue 2
920 '
930 CA$=ZZ$+STR$(INT(RND(1)*9)+1)
940 CA(2)=VAL(CA$):N1(2)=INT(RND(1)*9
8)+2:N2(2)=N1(2)-CA(2)
950 IF N2(2)<2 THEN 930
960 '
970 'Clue 4
980 '
990 N1(4)=INT(RND(1)*21)+10:N2(4)=INT
(RND(2)*21)+10:CA(4)=N1(4)*N2(4)
1000 CA$=STR$(CA(4)):ZZ$=MID$(CA$,2,1
)
1010 '
1020 'Clue 3
1030 '
1040 CA$=STR$(INT(RND(1)*9)+1)+ZZ$:CA
(3)=VAL(CA$)
1050 N1(3)=INT(RND(2)*48)+2:N2(3)=CA(
3)-N1(3)
1060 IF N2(3)<2 THEN 1040
1070 '
1080 'Clue 7
1090 '
1100 CA(7)=INT(RND(1)*89)+11:N2(7)=IN
T(RND(2)*11)+2:N1(7)=CA(7)*N2(7)
1110 CA$=STR$(CA(7)):ZZ$=RIGHT$(CA$,1
)
1120 '
1130 'Clue 5
1140 '
1150 CA$=STR$(INT(RND(1)*9)+1)+ZZ$+ST
R$(INT(RND(2)*9)+1):CA(5)=VAL(CA$)
1160 N2(5)=INT(RND(2)*11)+2:N1(5)=CA(
5)*N2(5)
1170 '
```




```
1180 'Clue 6
1190 '
1200 N1(6)=INT(RND(1)*21)+10:N2(6)=IN
T(RND(2)*21)+10:CA(6)=N1(6)*N2(6)
1210 CA$=STR$(CA(6)):ZZ$=MID$(CA$,3,1
)
1220 IF ZZ$="0" THEN 1200
1230 '
1240 'Clue 8
1250 '
1260 CA$=ZZ$+STR$(INT(RND(1)*9)+1):CA
(8)=VAL(CA$)
1270 N1(8)=INT(RND(2)*98)+2:N2(8)=N1(
8)-CA(8)
1280 IF N2(8)<2 THEN 1260
1290 '
1300 'Clue 12
1310 '
1320 N1(12)=INT(RND(1)*20)+11:N2(12)=
INT(RND(2)*20)+11:CA(12)=N1(12)*N2(12
1320 N1(12)=INT(RND(1)*20)+11:N2(12)=
INT(RND(2)*20)+11:CA(12)=N1(12)*N2(12
```

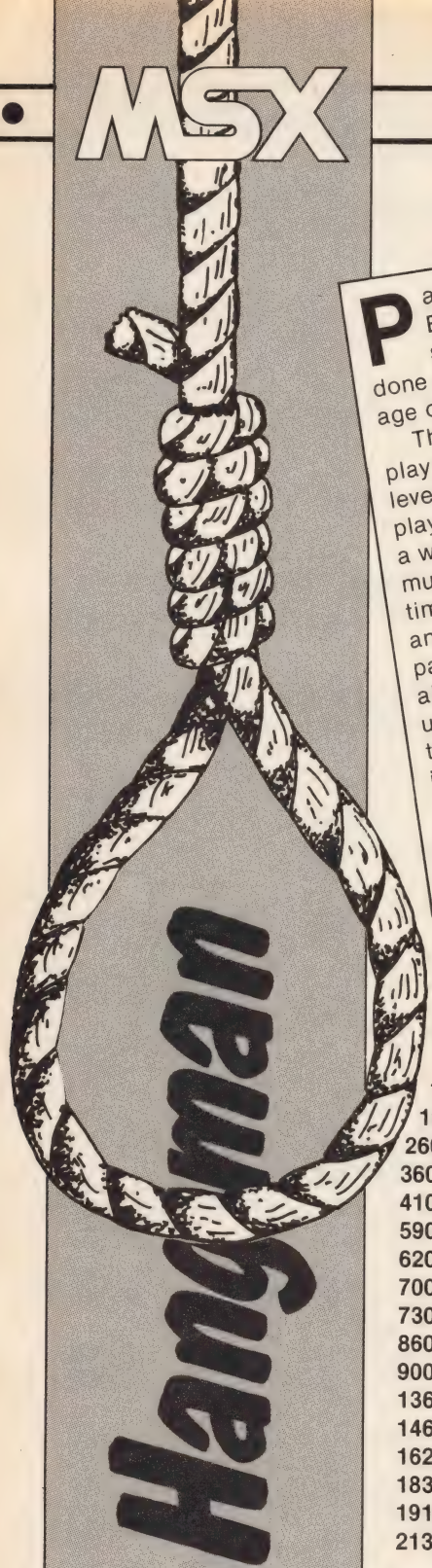
```
)
1330 CA$=STR$(CA(12)):ZZ$=MID$(CA$,3,
1)
1340 '
1350 'Clue 9
1360 '
1370 CA$=STR$(INT(RND(2)*9)+1)+ZZ$:CA
(9)=VAL(CA$)
1380 N1(9)=RND(1)*99+1:N2(9)=CA(9)-N1
(9)
1390 IF N2(9)<2 THEN 1370
1400 '
1410 'Clue 11
1420 '
1430 CA(11)=INT(RND(1)*90)+10:N2(11)=
INT(RND(2)*11)+2:N1(11)=CA(11)*N2(11)
1440 CA$=STR$(CA(11)):ZZ$=MID$(CA$,2,
1)
1450 '
1460 'Clue 10
1470 '
1480 CA$=STR$(INT(RND(1)*9)+1)+ZZ$:CA
```



```
(10)=VAL(CA$)
1490 N1(10)=INT(RND(2)*99)+1:N2(10)=N
1(10)-CA(10)
1500 IF N2(10)<2 THEN 1480
1510 RETURN
1520 '
1530 'Update the clock
1540 '
1550 PRESET(128,184):COLOR 1:PRINT#1,
STRING$(15,CHR$(200))
1560 T1=TIME:PRESET(128,184):COLOR 15
:PRINT#1,INT(TIME/3000)"m."INT(TIME/5
0)MOD60"s."
1570 RETURN
1580 '
1590 'No such number
1600 '
1610 COLOR 1:PRESET(192,ZZ):PRINT#1,S
TRING$(6,CHR$(200))
1620 COLOR 6:PRESET(176,ZZ):PRINT#1,"
Rubbish":FOR DL=1 TO 3000:NEXT
1630 COLOR 1:PRESET(160,ZZ):PRINT#1,S
TRING$(12,CHR$(200))
1640 COLOR 15:RETURN
1650 '
1660 'Put a digit in the grid
1670 '
1680 PRESET(XT,YT):PRINT#1,AT$:RETURN
1690 '
1700 'Check for end of game and wrong
 answers.
1710 '
1720 EN=-1:WA=0:FOR I=1 TO 12:IF FL(I
)=0 THEN EN=0
1730 IF FL(I)=99 THEN WA=-1
1740 NEXT:RETURN
1750 '
1760 'Erase
1770 '
1780 LINE(160,0)-(255,144),1,BF:RETUR
N
1790 '
1800 'All OK-game over
1810 '
1820 IF INKEY$<>"" THEN 1820
1830 A$="T255V15O5GR4ECR4DER4DEG"
1840 B$="T255V15O5ER4CO4GR4BO5CR4O4BO
5CE"
1850 PLAY A$,B$
1860 COLOR 7,1:SCREEN 0
1870 LOCATE 7,5:PRINT"ALL OK - END OF
 GAME"
1880 LOCATE 7,8:PRINT"You took";INT(T
1/3000);"min.";(T1/50)MOD60;"sec."
1890 IF LT=0 THEN LT=T1:GOTO 1910
1900 IF LT>0 AND T1<LT THEN LT=T1
1910 LOCATE 4,13:PRINT"Lowest so far"
;INT(LT/3000);"min.";(LT/50)MOD60;"se
c."
1920 RETURN
1930 A$="O2V15BBB":B$="O8V15CCC":C$="
O5V15DDD":PLAY A$,B$,C$
1940 COLOR 15:PRESET(160,16):PRINT#1,
"All finished":PRESET(160,32):PRINT#1
,"but these"
1950 PRESET(160,48):PRINT#1,"answers
are":PRESET(160,64):PRINT#1,"wrong."
1960 FOR I=1 TO 12:IF FL(I)=99 THEN C
OLOR9:XT=XX(I)+8:YT=YY(I)+4:AT$=CHR$(
200):GOSUB 1680
1970 NEXT:FOR DL=1 TO 8000:NEXT:RETUR
N
1980 '
1990 '
2000 DATA 16,40,112,136,88,16,64,16,6
4,112,136,40
2010 DATA 8,8,8,8,32,56,56,80,104,104
.104,128
2020 DATA A,D,A,D,D,D,A,A,D,A,D,A
2030 DATA 3,2,2,3,3,3,2,2,2,2,2,3
2040 DATA 88,45,43,88,246,88,246,45,4
3,45,246,88
2050 DATA 86,2,14,26,62,26,110,26,38,
50,110,50
2060 DATA 62,74,110,74,134,74,38,98,8
6,98,14,122,110,122
```

MSX

Hangman



Paul Finnerty and R.J. Brown of Oldham show what can be done to add new life to the age old game Hangman.

The game is for two players only and has two levels of difficulty. Each player takes a turn to enter a word which the other must guess, one letter at a time. A wrong guess lays another flagstone in the path to the gallows until all the flagstones are used up. There are 12 stones in the easy version but only 8 in the hard game.

It is almost worth losing to see the animated graphics which end the game.

Program breakdown

10-180	initialise
190-250	word input
260-350	select level
360-400	locate dashes on screen
410-580	input guess and validate
590-610	end of round
620-690	replay or end option
700-720	erase
730-850	set up variables
860-890	draw scenery
900-1350	draw gallows
1360-1450	lay flagstones
1460-1610	move clouds
1620-1820	move condemned man
1830-1900	has letter already been used?
1910-2120	introductory screen
2130-2240	DATA statements

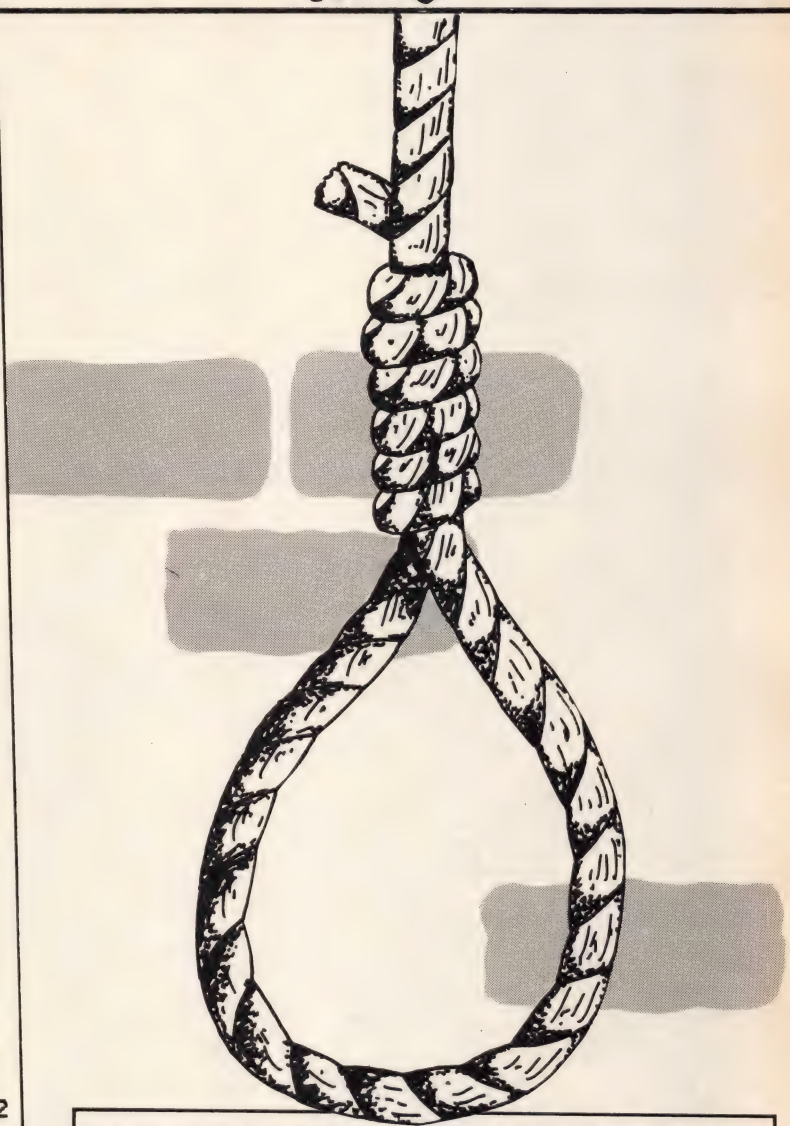
Main variables

N$	name of player 1
NN$	name of player 2
X$	word to be guessed
C$	latest guess
G	length of N$
H	length of NN$
B	length of X$
Q	number of games played
L	number of wrong guesses allowed
Z	number of wrong guesses made

```
10 '*******************************
20 '***                          ***
30 '***          HANGMAN         ***
40 '***                          ***
50 '*******************************
60 '
70 '*** P.FINNERTY & R.J.BROWN ***
80 '
90 '***         MAY 1985         ***
100 '
110 '***       <C> MCMLXXXV       ***
120 '
130 '
140 CLS:COLOR 15,7,7:SCREEN 2
150 MD$="T230S10M15000L203F+G+A+F+F+G
+A+F+A+B04C+1R1603A+B04C+1R32L4C+D+C+
03BA+2F+2L404C+D+C+03BA+2F+2L2F+C+F+1
F+C+F+1"
160 PLAY MD$:GOSUB 1920
170 Q=0
180 GOSUB 740
190 '***    INPUT    ***
200 CLS:KEYOFF:COLOR 15,2,2:SCREEN 0:
WIDTH39
210 IF Q>0 THEN 250
220 LOCATE 11,0:PRINT"WELCOME TO HANG
MAN":LOCATE 9,8:PRINT"A GAME FOR TWO
PLAYERS"
230 LOCATE 9,13:PRINT W1$;"1":LOCATE
9,22:PRINT W2$:LOCATE 14,18
240 INPUTN$:LOCATE 14,18:PRINT SPACE$
(16):LOCATE 9,13:PRINT W1$;"2":LOCATE
 14,18:INPUT NN$:G=LEN(N$):H=LEN(NN$)
:D=0:CLS
250 LOCATE 9,0:PRINT"SELECT CAPITAL L
ETTERS":LOCATE 9,22:PRINT W2$:LOCATE
(20-((3+G)/2)),7:PRINT"OK ";N$:LOCATE
 12,11:PRINT "ENTER YOUR WORD":LOCATE
 14,14:INPUTX$:B=LEN(X$)
260 '***   LEVEL OPTION    ***
270 CLS:LOCATE 5,10:PRINT"PRESS      1
=EASY    2=HARD"
280 A$=INKEY$:IF A$="" THEN 280
290 IF A$="1" THEN L=12
300 IF A$="2" THEN L=8
310 '***   SET SCREEN    ***
320 CLS:COLOR 1,7,7:SCREEN2,2
330 OPEN "GRP:" FOR OUTPUT AS #1
340 PSET(75,42),CE:PRINT#1,"WAIT A MO
MENT":PLAY MD$
350 GOSUB 870
360 '***   WORD LOCATION    ***
370 FOR I=(61-((B*8)/2)) TO (60+((B*8
)/2))STEP 8
380 PSET(I,180),CA:PRINT#1,"_":NEXT
390 RESTORE 2130:GOSUB 1470:GOSUB 720
400 PSET(31,42),1:PRINT#1,"NOW TRY AN
D GUESS A LETTER"
410 '***   MAIN ROUTINE    ***
420 C$=INKEY$
430 GOSUB 1540
440 IF C$="" THEN 420 ELSE 450
450 GOTO 1840
460 C=0:FOR N=1 TO B
470 C=INSTR(C+1,X$,C$)
480 IF C=0 AND N=1 THEN 570
490 IF C=0 THEN 420
500 PSET((53-((B*8)/2)+(C*8)),178),CA
:PRINT#1,C$:GOSUB 710
510 PRINT#1,"CORRECT":PLAY MB$
520 IF C>0 THEN D=D+1
530 IF D=B THEN 590
540 GOSUB 580
550 NEXT
560 GOTO 420
570 GOSUB 710:PRINT#1," WRONG ":PLAY
MC$:Z=Z+1:GOSUB 1370:GOSUB 580:GOTO 4
20
580 IF Z=L THEN 610 ELSE RETURN
590 FORI=1 TO 400:NEXT:GOSUB 720
600 PSET(87,40),CE:PRINT#1,"WELL DONE
":PSET((128-(((H*8)+70))/2),50),CE:PR
INT#1,NN$;" YOU WIN ":GOSUB 840:FOR I
=1 TO 3000:NEXT:GOTO 630
610 GOSUB 720:GOSUB 1630:PSET((127-((
G*8)/2)),32),CE:PRINT#1,N$:PSET(63,42
),CE:PRINT#1," HAS BEATEN YOU ":PSET(
(127-((H*8)/2)),52),CE:PRINT#1,NN$:PS
ET((61-((B*8)/2)),178):PRINT#1,X$:FOR
 I=1 TO 3000:NEXT:GOTO 630
620 '***   REPLAY OPTION    ***
630 CLS:SCREEN0:COLOR 1,7,7:LOCATE 8,
10:PRINT"DO YOU WANT TO PLAY AGAIN"
640 LOCATE 8,14:PRINT"ENTER Y FOR YES
 N FOR NO"
650 A$=INKEY$: IFA$="Y" OR A$="y" THE
N 670
660 IF A$="N" OR A$="n" THEN 680 ELSE
 650
670 SWAP N$,NN$:SWAP G,H:Q=Q+1:GOTO 1
80
680 CLS:COLOR 15,4,4:LOCATE 8,10:PRIN
T"THANK YOU FOR PLAYING":LOCATE 13,14
:PRINT"SEE YOU SOON":PLAY MD$
690 GOTO 690
700 '***   ERASE ROUTINE    ***
710 LINE(187,127)-(247,139),CD,BF:PSE
T(189,129),CD:RETURN
720 LINE(31,42)-(250,58),CE,BF:RETURN
730 '***   MAIN VARIABLES    ***
740 X$="":B$="":C$="":CA=8:CB=11:CD=2
:CE=7:CF=6:CG=12:CH=1:D=0:L=0:X=0:Y=2
:Z=0:XX=90:YY=132:J=9:P=150:CLOSE:RET
URN
750 ZW$="C11BR7D2R2FR2NED2FD2NR2DGD2N
FL2GL2ND2LHL2NGU2HUNL2U2EU2NHR2EBD4":
```

```
ZZ$="C7HGBR5EFBD3G2L3H2"
760 ZX$="BRC15R4DL4DR4GL2FC10D3E3DG2L
2H2UF4C1RL5"
770 MA$="T255M6000L202R2G.R64G.R64G6R
32G.R6BR4A5R32A3R4GR32GR64F+R8G."
780 MB$="T120S1M1500L1605GE"
790 MC$="T255S1M70003L16GGGGGGGGT255S
1M70007L16CCCCCCCC"
800 ME$="02L16BFBFBF"
810 W1$="ENTER NAME OF PLAYER "
820 W2$="THEN PRESS RETURN KEY"
830 RETURN
840 PLAY"T100S1M10000","T100S1M10000"
,"T100S1M10000":PLAY"05C404A8.A+1605C
404F4L16GAA+05C04A+8A8G2","04A4F8.G16
A4C4L16EFGAG8F8E2"
850 RETURN
860 '***   SCENERY   ***
870 CIRCLE(0,191),171,CD,.9,2,.55
880 CIRCLE(255,191),191,CD,0,2.49,.65
890 PAINT(20,191),CD
900 '***   BASE   ***
910 PSET(65,145)
920 LINE-STEP(-55,27),CA
930 LINE-STEP(0,18),CA
940 LINE-STEP(96,0),CA
950 LINE-STEP(55,-27),CA
960 LINE-STEP(0,-18),CA
970 LINE-STEP(-96,0),CA
980 PAINT(70,189),CA
990 '***   GALLOWS   ***
1000 PSET(30,162)
1010 LINE-STEP(0,-96),CA
1020 LINE-STEP(10,-5),CA
1030 LINE-STEP(60,0),CA
1040 LINE-STEP(0,8),CA
1050 LINE-STEP(-10,5),CA
1060 LINE-STEP(-40,0),CA
1070 LINE-STEP(0,85),CA
1080 PAINT(31,160),CA
1090 PSET(10,172)
1100 LINE-STEP(96,0),CB
1110 LINE-STEP(55,-27),CB
1120 PSET(106,172)
1130 LINE-STEP(0,16),CB
1140 PSET(31,162)
1150 LINE-STEP(10,0),CB
1160 LINE-STEP(10,-5),CB
1170 LINE-STEP(0,-5),CB
1180 PSET(41,162)
1190 LINE-STEP(0,-80),CB
1200 PSET(31,66)
1210 LINE-STEP(59,0),CB
1220 LINE-STEP(0,6),CB
1230 PSET(80,155)
1240 LINE-STEP(-16,8)
1250 LINE-STEP(32,0)
1260 LINE-STEP(16,-8)
1270 LINE-STEP(-32,0)
1280 PSET(180,3),CE:DRAW ZW$:PAINT(18
6,8),CB:PSET(186,9),CE:DRAW ZZ$
1290 PSET(17,140),CD:DRAW ZX$:PSET(13
7,130),CD:DRAW ZX$:PSET(150,125),CD:D
RAW ZX$:PSET(200,110),CD:DRAW ZX$:PSE
T(230,145),CD:DRAW ZX$:PSET(180,155),
CD:DRAW ZX$
1300 LINE(120,106)-(122,116),CF,BF:CI
RCLE(122,100),8,CG,,,1.4:PAINT(121,10
0),CG,CG
1310 LINE(215,85)-(219,105),CF,BF:CIR
CLE(218,77),15,CG,,,1.4:PAINT(217,77)
,CG,CG
1320 LINE(170,110)-(176,135),CF,BF:CI
RCLE(174,90),23,CG,,,1.4:PAINT(173,90
),CG,CG
1330 LINE(89,75)-(89,120),CH
1340 CIRCLE(89,126),5,CH,,,1.75
1350 RETURN
1360 '***   PATHWAY   ***
1370 PSET(P,172)
1380 LINE-STEP(-16,8),CB
1390 LINE-STEP(8,0),CB
1400 LINE-STEP(16,-8),CB
1410 LINE-STEP(-8,0),CB
1420 PAINT(P+2,173),CB:BEEP
1430 IF L=8 THEN P=P+13
1440 IF L=12 THEN P=P+9
1450 RETURN
1460 '***   CLOUDS   ***
1470 FOR I=1 TO 14:S$="":IF I=4 THEN
RESTORE 2130
1480 FOR K=1 TO 32:READ SD
1490 S$=S$+CHR$(SD)
1500 NEXT
1510 SPRITE$(I)=S$
1520 NEXT
1530 RETURN
1540 PUT SPRITE 31,(X,Y),15,1
1550 PUT SPRITE 30,(X+16,Y),15,2
1560 PUT SPRITE 29,(X+32,Y),15,3
1570 PUT SPRITE 28,(XX,Y+17),14,4
1580 PUT SPRITE 27,(XX+16,Y+17),14,5
1590 PUT SPRITE 26,(XX+32,Y+17),14,6
1600 X=X+.75:XX=XX+1
1610 RETURN
1620 '***   CONDEMNED MAN   ***
1630 PLAY MA$:PLAY MA$
1640 FOR I=1 TO 600:NEXT
1650 FOR XA=235 TO 80 STEP-3
1660 IF J>11 THEN J=9
1670 PUT SPRITE 23,(XA,YY),9,7 :'HEAD
1680 PUT SPRITE 24,(XA,YY+12),4,8:'BO
DY
1690 PUT SPRITE 25,(XA,YY+27),1,J:'LE
GS
1700 PUT SPRITE 22,(XA,YY+12),4,J+3
1710 J=J+1
1720 IF XA<135 THEN YY=YY-17
1730 IF YY<115 THEN YY=115
1740 GOSUB 1540
```

```
1750 FOR I=1 TO 25:NEXT
1760 NEXT:PAINT(82,157),1:FOR I=1 TO
100:NEXT
1770 FOR I=9 TO 14
1780 PUT SPRITE I+11,(XA,YY),0,I
1790 NEXT
1800 LINE(84,121)-(94,131),CD,BF
1810 LINE(89,75)-(89,158),CH
1820 RETURN
1830 '***   USED LETTER CHECK    ***
1840 F=0:FOR I=1 TO B
1850 F=INSTR(F+1,B$,C$)
1860 B$=B$+C$
1870 IF F>0 THEN 1880 ELSE 460:NEXT
1880 GOSUB 720:GOSUB 710
1890 PSET(35,42),CE:PRINT#1,C$;" HAS
ALREADY BEEN USED"
1900 PSET(91,52),CE:PRINT#1,"TRY AGAI
N":PLAY ME$:FOR I=1 TO 800:NEXT:GOSUB
 720:GOTO 400
1910 '***   INITIALISE    ***
1920 OPEN"GRP:"FOR OUTPUT AS #1:C=15:
CZ=14:Y=125:X1=80:X2=200
1930 CIRCLE(90,80),40,C,2.6,5.7,.8
1940 CIRCLE(150,85),35,C,3.7,5.7,.7
1950 CIRCLE(195,70),35,C,4,.9,1.2
1960 CIRCLE(175,40),40,C,6.1,3,.75
1970 CIRCLE(120,50),25,C,.7,1.65,1.1
1980 CIRCLE(80,40),45,C,.6,4.2,.6
1990 PAINT(90,111),C
2000 FOR J=1 TO 4
2010 FOR I=X1 TO X2 STEP 15
2020 PSET(I,Y),CZ
2030 DRAW"C14M-3,+4M-3,+1M-1,-1M+2,-2
M+4,-2"
2040 PAINT(I-3,Y+3),CZ
2050 NEXT:X1=X1-10:X2=X2-10:Y=Y+20
2060 NEXT
2070 LINE(76,46)-(148,58),13,BF
2080 PSET(82,49):PRINT#1,"RAINYDAY"
2090 LINE(120,73)-(192,85),13,BF
2100 PSET(126,76):PRINT#1,"SOFTWARE"
2110 GOSUB 750
2120 FOR I=1 TO 5500:NEXT:RETURN
2130 DATA 0,0,0,3,15,63,127,255,243,1
25,126,62,29,1,0,0,1,3,199,247,251,25
3,253,251,247,255,255,255,255,255,255
,60
2140 DATA 224,253,251,223,239,247,251
,253,253,253,251,247,255,125,62,12,0,
28,190,247,251,251,251,231,255,255,25
4,252,240,224,192,0
2150 DATA 32,112,243,247,207,255,255,
249,254,255,255,63,31,15,7,0,0,204,24
6,247,247,238,252,248,126,191,223,238
,236,224,192,0
2160 DATA 0,0,0,0,0,0,0,0,0,0,0,1,3,7,3
,3,1,0,0,0,0,0,0,0,0,0,0,128,192,192,
192,128,128
2170 DATA 0,0,0,0,1,3,7,2,5,7,5,2,7,7
```



```
,3,3,0,0,0,0,192,224,240,160,80,240,8
0,160,224,224,224,224
2180 DATA 3,3,3,3,1,1,1,1,1,1,1,1,1,1
,7,7,224,224,224,224,224,192,192,192,
192,192,192,192,192,192,192,192
2190 DATA 3,3,3,7,15,30,60,56,48,48,4
8,48,240,240,0,0,224,224,224,224,224,
224,192,192,192,192,224,112,56,28,56,
48
2200 DATA 3,3,3,3,3,7,7,14,14,28,28,5
6,184,240,112,48,224,224,224,224,112,
112,56,56,28,12,14,6,7,7,14,8
2210 DATA 0,0,0,0,0,0,1,1,1,1,0,0,0,1
,1,1,0,0,0,0,0,0,0,128,192,224,224,240,
112,224,224,192,128
2220 DATA 0,0,0,0,0,1,1,97,112,120,60
,28,0,3,3,0,0,0,0,0,0,128,192,224,240
,120,56,56,248,240,224,0
2230 DATA 0,0,0,0,0,0,193,227,247,127
,62,28,0,0,0,0,0,0,0,0,0,0,192,208,15
2,28,12,28,24,16,0,0
2240 DATA 0,0,0,0,0,0,1,1,1,1,0,0,0,1
,1,1,0,0,0,0,0,0,128,192,224,224,240,
112,224,224,192,128
```

Rabbit Run

The object is to guide the rabbit through the maze, avoiding the malicious cats and the flashing hordes of carnivorous insects.

If you reach the end of the maze, move the rabbit off the edge and he will appear at the bottom again. This time the cats will move faster or slower depending on the direction in which they were travelling when you left the maze. Each time you complete a trip you are awarded ten points, with a bonus of 50 for every five completed journeys.

The secret is to ensure that the cats do not either move too fast to dodge, or go so slowly that they block your path (they have even been known to grind to a halt).

This fiendish game was created by John Mowlem of Balby near Doncester. It uses the cursor keys.

Program breakdown

10-40	set up
50-290	draw maze
300-480	define sprites
490-520	set up more variables
530-540	sprite collision detection
550	test cursor keys
560-580	move rabbit left or right
590	check for maze end
600	bonus points
610-620	move rabbit up or down
630-800	move cats
810-870	flash insects
880	go back to test cursor keys
890-960	end game
970-1280	sprite DATA
1290-1320	bounce rabbit off wall
1330-1440	award bonus points

Main variables

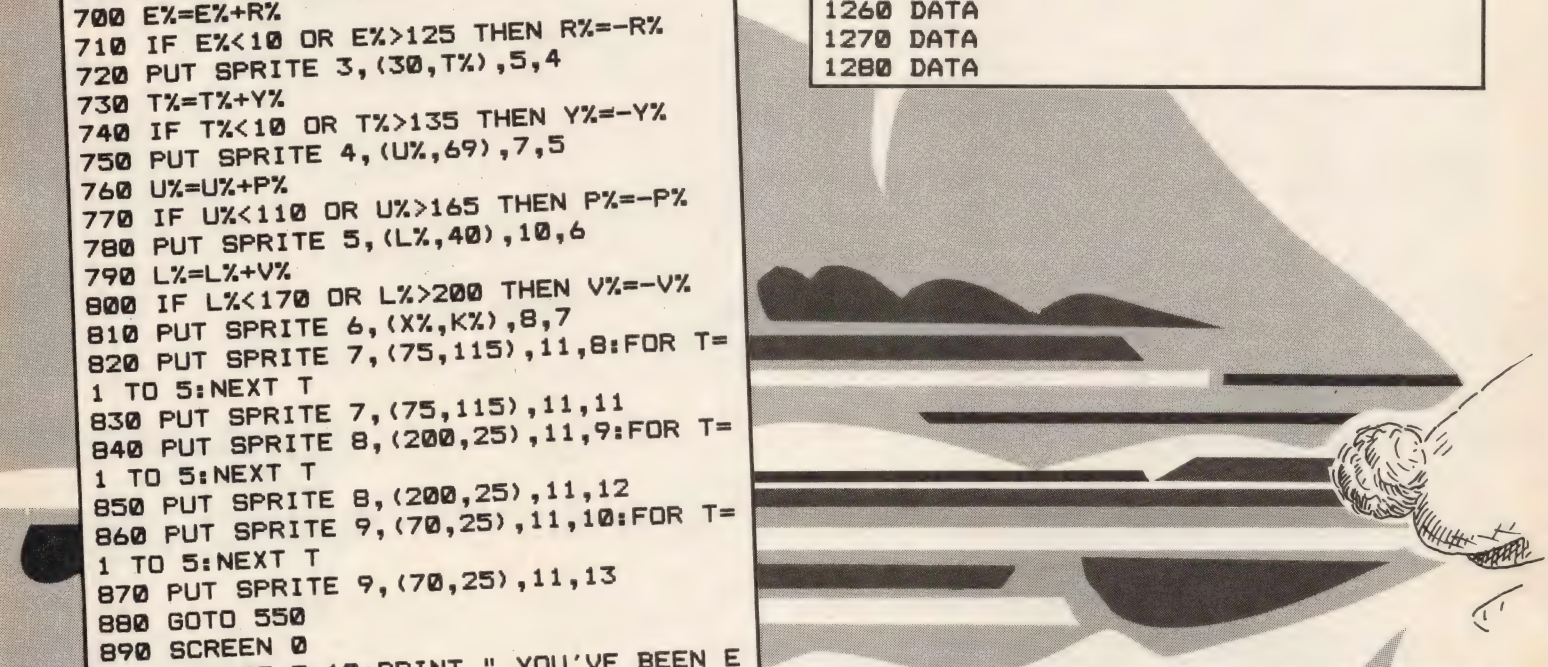
Z	score
S$	cat sprite
B$	rabbit sprite
A$,C$	flashing insect sprite
X%,K%	rabbit co-ordinates
S%,Q%,E%,T%,U%,L%	X and Y co-ordinates of cats
M%,Z%,R%,Y%,P%,V%	cat speeds

```
5 'Rabbit Run by John Mowlem
10 Z=0
20 COLOR 15,1,4:SCREEN 2,1
30 KEY OFF:
40 OPEN"grp:" FOR OUTPUT AS #1
50 LINE(20,0)-(240,4),15,BF
60 LINE(20,40)-(24,191),15,BF
70 LINE(20,191)-(240,185),15,BF
80 LINE(236,148)-(240,0),15,BF
90 LINE(50,0)-(53,60),15,BF
100 LINE(50,60)-(75,63),15,BF
110 LINE(85,30)-(105,33),15,BF
120 LINE(105,30)-(108,90),15,BF
130 LINE(135,0)-(138,60),15,BF
140 LINE(105,90)-(185,93),15,BF
150 LINE(182,90)-(185,60),15,BF
160 LINE(185,60)-(165,63),15,BF
170 LINE(165,60)-(168,35),15,BF
180 LINE(165,32)-(200,35),15,BF
190 LINE(213,62)-(216,148),15,BF
200 LINE(216,145)-(240,148),15,BF
210 LINE(216,145)-(150,148),15,BF
220 LINE(153,145)-(150,125),15,BF
230 LINE(182,90)-(185,120),15,BF
240 LINE(150,128)-(120,125),15,BF
250 LINE(123,125)-(120,148),15,BF
260 LINE(20,155)-(90,158),15,BF
270  LINE(120,125)-(90,128),15,BF
280 LINE(50,155)-(53,93),15,BF
290 LINE(50,93)-(180,90),15,BF
300 RESTORE 970
```

```
310 FOR I=1 TO 8:READ D$
320 S$=S$+CHR$(VAL("&B"+D$)):NEXT I
330 FOR X=1 TO 6
340 SPRITE$(X)=S$:NEXT X
350 RESTORE 1050
360 FOR I=1 TO 8:READ E$
370 B$=B$+CHR$(VAL("&B"+E$)):NEXT I
380 SPRITE$(7)=B$
390 RESTORE 1130
400 FOR I=1 TO 8:READ F$
410 A$=A$+CHR$(VAL("&B"+F$)):NEXT I
420 FOR X=8 TO 10
430 SPRITE$(X)=A$:NEXT X
440 RESTORE 1210
450 FOR I=1 TO 8:READ G$
460 C$=C$+CHR$(VAL("&B"+G$)):NEXT I
470 FOR X=11 TO 13
480 SPRITE$(X)=C$:NEXT X
490 X%=215:K%=160
500 S%=95:M%=4:Q%=140:Z%=3
510 E%=10:R%=4:T%=10:Y%=5
520 U%=110:P%=2:L%=200:V%=1
530 SPRITE ON
540 ON SPRITE GOSUB 890
550 T=STICK(0)
560 IF T=3 THEN X%=X%+5.3:IF POINT (X
%+8,K%+8)=15 THEN GOSUB 1290
570 IF X%>225 THEN X%=225
```

```
580 IF T=7 THEN X%=X%-5:IF POINT (X%+
3,K%+10)=15 THEN GOSUB 1300
590 IF X%<10 THEN X%=215:Z=Z+10:K%=16
0:M%=M%+1:Z%=Z%+1:R%=R%+1:Y%=Y%+1:V%=
V%+1:P%=P%+1
600 IF Z=50 OR Z=150 OR Z=250 THEN GO
SUB 1330
610 IF T=1 THEN K%=K%-5:IF POINT (X%+
5,K%)=15 THEN GOSUB 1310
620 IF T=5 THEN K%=K%+5.5:IF POINT (X
%+5,K%+15)=15 THEN GOSUB 1320
630 PUT SPRITE 0,(S%,165),2,1
640 S%=S%+M%
650 IF S%<25 OR S%>105 THEN M%=-M%
660 PUT SPRITE 1,(129,Q%),13,2
670 Q%=Q%+Z%
680 IF Q%<130 OR Q%>165 THEN Z%=-Z%
690 PUT SPRITE 2,(218,E%),4,3
700 E%=E%+R%
710 IF E%<10 OR E%>125 THEN R%=-R%
720 PUT SPRITE 3,(30,T%),5,4
730 T%=T%+Y%
740 IF T%<10 OR T%>135 THEN Y%=-Y%
750 PUT SPRITE 4,(U%,69),7,5
760 U%=U%+P%
770 IF U%<110 OR U%>165 THEN P%=-P%
780 PUT SPRITE 5,(L%,40),10,6
790 L%=L%+V%
800 IF L%<170 OR L%>200 THEN V%=-V%
810 PUT SPRITE 6,(X%,K%),8,7
820 PUT SPRITE 7,(75,115),11,8:FOR T=
1 TO 5:NEXT T
830 PUT SPRITE 7,(75,115),11,11
840 PUT SPRITE 8,(200,25),11,9:FOR T=
1 TO 5:NEXT T
850 PUT SPRITE 8,(200,25),11,12
860 PUT SPRITE 9,(70,25),11,10:FOR T=
1 TO 5:NEXT T
870 PUT SPRITE 9,(70,25),11,13
880 GOTO 550
890 SCREEN 0
900 LOCATE 7,10:PRINT " YOU'VE BEEN E
ATEN !"
910 LOCATE 8,15:PRINT"SCORE :";Z
920 PLAY"L4GL8DR64DL4EDR5F#G"
930 LOCATE 3,22:PRINT"DO YOU WISH TO
PLAY AGAIN Y/N ?"
940 A$=INKEY$:IF A$="Y" THEN RUN
950 IF A$="N" THEN CLS:PRINT"GOODBYE"
:END
960 GOTO 940
970 DATA 00100100
980 DATA 00111100
990 DATA 01111110
1000 DATA 01011010
1010 DATA 01111110
1020 DATA 01100110
1030 DATA 00111100
1040 DATA 00011000
1050 DATA 00101000
```

```
1060 DATA 00101000
1070 DATA 00101000
1080 DATA 00111000
1090 DATA 01010100
1100 DATA 01111100
1110 DATA 01101100
1120 DATA 00111000
1130 DATA 10010010
1140 DATA 01010100
1150 DATA 00111000
1160 DATA 11101110
1170 DATA 00111000
1180 DATA 01010100
1190 DATA 10010010
1200 DATA 00000000
1210 DATA
1220 DATA
1230 DATA
1240 DATA
1250 DATA
1260 DATA
1270 DATA
1280 DATA
```



```
1290 FOR D=1 TO 200:NEXT D:X%=X%-10:R
ETURN
1300 FOR D=1 TO 200:NEXT D:X%=X%+10:R
ETURN
1310 FOR D=1 TO 200:NEXT D:K%=K%+10:R
ETURN
1320 FOR D=1 TO 200:NEXT D:K%=K%-10:R
ETURN
1330 SCREEN 0
1340 PLAY"L20CR64CR64CR64L4FAR8"
1350 PLAY"L20CR64CR64CR64L4FAR8"
1360 PLAY"L6FR64L16FER64EDR64DC2"
1370 FOR X=1 TO 10
1380 Z=Z+5:LOCATE 5,9:PRINT"50 BONUS
POINTS! SCORE:";Z
1390 FOR F= 1 TO 50:NEXT F
1400 LOCATE 5,9:PRINT SPC(27)
1410 FOR F=1 TO 50:NEXT F
1420 NEXT X
1430 COLOR 15,1,4:SCREEN 2,1:KEY OFF
1440 GOTO 50
```

The Island

Please help me to escape from the Island. In my last attempt my small boat sank and I am now drifting on a piece of driftwood not far from the shore. Only with your help can I avoid death and survive to see another day. You must give me instructions in the form of two-word sentences such as 'eat food'.

To help you, the ten function keys have been defined to contain some of the most commonly used instructions. Please note that instructions must be given in lower case.

Program breakdown

30	initialise program
40	define the screen colours
50	titles
60-70	define the function keys
80	read the data into the arrays
90-290	data for the locations
300	read the data into the arrays for the objects
310-360	data for the objects
370-680	main control loop
690	subroutines for the action

Main variables

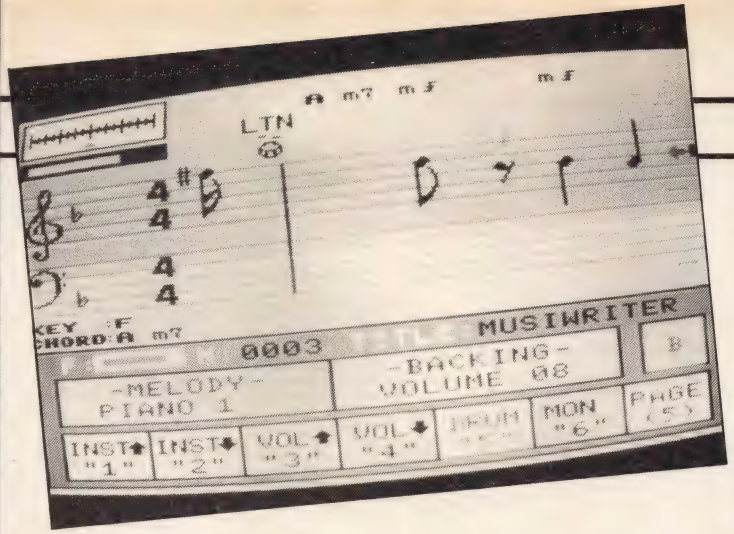
S%(x,y)	holds the map
V$(X)	holds the list of items being carried
P%	current location
Q$(X)	description of locations
G$(X)	description of objects
L$	second word typed in
Z$,B$,C$,D$	input instructions
N$(X)	words understood
N%(X),B%(X)	pointers to objects
AA-AZ	flags
E%,R	flags to objects carried

```
10 REM ** The Island **
20 REM ** S.W. Lucas May 1985 **
30 P%=1:SCREEN 0:DIM V$(5),G$(22),Q$(
22),N%(22),N$(22),B%(22),S%(22,4)
40 WIDTH 37:COLOR15,4:KEY ON
50 LOCATE 12,2:PRINT"The Island":LOCA
TE 5,10:PRINT"An adventure by Steve L
ucas"
60 KEY 1,"n"+CHR$(13):KEY 2,"s"+CHR$(
13):KEY 3,"e"+CHR$(13):KEY 4,"w"+CHR$
(13):KEY 5,"help"+CHR$(13)
70 KEY 6,"invent"+CHR$(13):KEY 7,"sco
re"+CHR$(13):KEY 8,"pray"+CHR$(13):KE
Y 8,"wait"+CHR$(13):KEY 9,"swim"+CHR$
(13):KEY 10,"paddle"+CHR$(13)
80 FOR S=1 TO 21:READ Q$(S):FOR T=1 T
O 4:READ S%(S,T):NEXT T,S:CLS
90 DATA floating on a piece of driftw
ood not far from a small island.,0,0,
0,0
100 DATA on a rocky beach. A steep cl
iff riseshigh above me to the west.,0
,3,0,0
110 DATA on a sandy shore. A gnarled
tree      hangs over from the top of t
he cliff.,2,0,0,0
120 DATA at the top of a steep cliff
face. A  gnarled tree hangs over the
cliff.,0,5,0,0
130 DATA on a narrow footpath leading
 along    the cliff top.,4,7,6,0
140 DATA at the centre of a stone cir
cle.      Shadowy figures flit through
 the      stones in the distance.,0,0,
0,5
150 DATA by an enormous steel gate. I
 can justmake out the outline of a bu
ilding    through the mist.,5,0,0,0
160 DATA in a small courtyard. An eer
ie figurestands to my south.,7,0,9,10
170 DATA at the main entrance to a la
rge brickbuilding.,0,0,0,8
180 DATA in a garden full of exotic p
lants andstrange animals.,0,11,8,0
190 DATA on the northern banks of a f
ast       flowing river. A shoal of fi
sh can    be seen in the water.,10,0,0
,0
200 DATA on the river banks. There's
a wooden hut to the west.,0,17,13,0
210 DATA on a narrow staircase which
winds     down between two brick walls
.,0,0,0,12
220 DATA at the bottom of a flight of
 stairs. There's a small door here.,0
,0,0,0
230 DATA in a small wooden hut. There
 is a     cauldron of broth simmering
over a    coal fire.,0,16,12,0
240 DATA by a large cupboard hanging
on the wall.,15,0,0,0
250 DATA in a dark and gloomy forest.
,12,17,18,17
260 DATA in a dark and gloomy forest.
,18,19,17,17
270 DATA in a dark and gloomy forest.
,18,17,20,19
280 DATA on a sandy beach. A gloomy f
orest      lies to the west.,0,0,0,19
290 DATA in a small rowing boat.,0,0,
0,2
300 FOR T=1 TO 21:READ G$(T),B%(T),N$
(T):N%(T)=T:NEXT
310 DATA a small fish,1,fish,an enorm
ous rock,2,rock," ",2,rope,a green li
zard,3,lizard
320 DATA a rusty tin,4,tin,a plank of
 wood,5,plank,a chisel,16,chisel,a do
or knocker,9,knocker,a two headed mon
ster,18,monster
330 DATA a cauldron of food,15,cauldr
on," ",14,boat
340 DATA an evil wolf,13,wolf,a ladel
,16,ladel,an irate farmer,17,farmer,a
 large egg,6,egg,a small key,4,key
350 DATA a padlock and chain,7,padloc
k,a sheep dog,10,dog,a large notice,1
1,notice
360 DATA a pair of dirty boots,12,boo
ts,a pile of logs,19,logs
370 IF P%=13 THEN AU=AU+1:IF AU>3 AND
 AW=0 THEN X$="The wolf attacks!":GOS
UB 1050
380 IF P%=1 THEN GOSUB 1340
390 IF P%=7 AND SA=0 THEN GOSUB 1370
400 IF P%=9 AND SB=0 THEN GOSUB 1410
410 IF P%=18 THEN AX=AX+1:IF AX>3 AND
 AY=0 THEN X$="The monster turns roun
d and sees me. It breaths fire all ov
er me.":GOSUB 1050
420 IF P%=17 AND AK<2 THEN AQ=AQ+1:IF
 AQ>3 THEN X$="The farmer comes over
and hits me!":GOSUB 1050
430 IF AT=1 THEN PRINT"I'm wearing a
pair of dirty boots."
440 IF P%=3 THEN AP=AP+1:IF AP>7 THEN
 X$="The lizard attacks me":GOSUB 105
0
450 PRINT:PRINT"I am :-":PRINTQ$(P%):
A$="":IFS%(P%,1)>0 THEN A$="North"
460 IF P%=1 THEN A$="to the shore"
470 IF S%(P%,2)>0 AND LEN(A$)=0 THEN
A$="South" ELSE IF S%(P%,2)>0 THEN A$
=A$+",South"
480 IF S%(P%,3)>0 AND LEN(A$)=0 THEN
A$="East" ELSE IF S%(P%,3)>0 THEN A$=
A$+",East"
490 IF S%(P%,4)>0 AND LEN(A$)=0 THEN
A$="West" ELSE IF S%(P%,4)>0 THEN A$=
A$+",West"
500 IF P%=14 THEN A$="Up" ELSE IF P%=
13 THEN A$=A$+",Down" ELSE IF P%=12 T
HEN A$=A$+",In"
510 PRINT:PRINT"I can travel :-":PRIN
TA$
520 E=0:FOR T=1 TO 21:PP%=0:IF B%(T)=
P% THEN PP%=1
530 IF PP%=1 THEN GOTO 550
540 NEXT:GOTO 580
550 IF E=0THEN PRINT:PRINT"I can see
```

```
:-"
560 IF P%=14 AND AN=0 THEN PRINT"a kn
ocker on the door"
570 PRINTG$(T):E=1:GOTO 540
580 PRINT:INPUT"What should I do now
";Z$:B$=LEFT$(Z$,2):C$=LEFT$(Z$,3):D$
=LEFT$(Z$,4)
590 CLS:BEEP:IF C$="loo" OR C$="exa"
THEN PRINT"I can see nothing special"
 ELSE IF C$="sea" THEN PRINT"I can't
find anything!"
600 IF C$="dri" THEN PRINT"I'm not th
irsty" ELSE IF C$="eat" THEN PRINT"I'
m not hungry at the moment"
610 IF C$="sco" THEN PRINT"This is NO
T a game you know!" ELSE IF C$="tak"
OR C$="get" THEN GOSUB 720 ELSE IF C$
="cli" OR C$="up" OR D$="go u" THEN G
OSUB 1200
620 IF C$="inv" THEN GOSUB 1000 ELSE
IF C$="lea" OR C$="dro" OR C$="put" T
HEN GOSUB 890 ELSE IF C$="thr" THEN G
OSUB 1160 ELSE IF C$="kno" THEN GOSUB
 1120
630 IF C$="hel" THEN PRINT"I'm as con
fused as you are!" ELSE IF C$="lif" T
HEN GOSUB 1100 ELSE IF C$="pad" OR C$
="swi" THEN GOSUB1030
640 IF (B$="w" OR D$="go w") AND S%(P
%,4)>0 THEN P%=S%(P%,4):GOTO 370 ELSE
 IF (B$="w" OR D$="go w") THEN PRINT"
I can't go that way!":GOTO 370
650 IF (B$="e" OR D$="go e") AND S%(P
%,3)>0 THEN P%=S%(P%,3):GOTO 370 ELSE
 IF (B$="e" OR D$="go e") THEN PRINT"
I can't go that way!"
660 IF (B$="s" OR D$="go s") AND S%(P
%,2)>0 THEN P%=S%(P%,2):GOTO 370 ELSE
 IF (B$="s" OR D$="go s") THEN PRINT"
I can't go that way!"
670 IF (B$="n" OR D$="go n") AND S%(P
%,1)>0 THEN P%=S%(P%,1):GOTO 370 ELSE
 IF (B$="n" OR D$="go n") THEN PRINT"
I can't go that way!"
680 IF C$="in" OR D$="go i" THEN GOSU
B 1240 ELSE IF C$="wea" THEN GOSUB 13
20 ELSE IF C$="unl" THEN GOSUB 1220
690 IF P%=11 AND C$="rea" THEN PRINT"
The notice reads..danger sharks." ELS
E IF C$="rea" THEN PRINT"There's noth
ing here to read!"
700 IF C$="go d" OR C$="dow" THEN GOS
UB 1250 ELSE IF C$="use" OR C$="chi"
THEN GOSUB 1260 ELSE IF C$="row" OR C
$="sai" OR C$="lau" THEN GOSUB 1290
710 GOTO 370
720 GOSUB 840:IF L%<>1 THEN RETURN
730 E%=0:FOR H=1 TO 21:IF B%(H)=P% AN
D H=R THEN E%=1
740 NEXT:IF E%<>1 THEN PRINT"I can't
see a ";L$;" here!":RETURN
750 IF R=1 THEN AB=1 ELSE IF R=2 THEN
 X$="Aaagghhh I broke my back!":GOSUB
1050 ELSE IF R=10 THEN PRINT"I can't
lift it!":RETURN
760 IF R=4 THEN X$="It attacks me!:go
sub 760 else if r=3 then ac=1
770 IF R=5 THEN X$="I cut myself and
bleed to death!":GOSUB 1050 ELSE IF R
=6 THEN AD=1 ELSE IF R=7 THEN AE=1 EL
SE IF R=8 THEN PRINT"Don't be absurd!
":RETURN
780 IF R=9 THEN X$="It breathes fire
over me and I burn  to death!":GOSUB
1050 ELSE IF R=10 THEN AF=1 ELSE IF R
=11 THEN AG=1 ELSE IF R=12 THEN X$="I
t goes for the throat... aaaggghhh!";
GOSUB 1050 ELSE IF R=13 THEN AH=1
790 IF R=14 THEN PRINT"Don't be stupi
d!":RETURN ELSE IF R=15 THEN AI=1 ELS
E IF R=16 THEN AJ=1 ELSE IF R=17 THEN
 PRINT"Don't be absurd!":RETURN
800 IF R=18 THEN AK=1 ELSE IF R=19 TH
EN PRINT"It's stuck!":RETURN  ELSE IF
 R=20 THEN AL=1 ELSE IF R=21 THEN AM=
1
810 E%=0:FOR X=1 TO 4:IF V$(X)="" THE
N V$(X)=G$(N%(R)):X=7:E%=1
820 NEXT X:IF E%=0 THEN PRINT"I can't
 carry any more!":RETURN
830 B%(N%(R))=0:RETURN
840 L$="":H=INSTR(Z$," ")
850 L$=RIGHT$(Z$,(LEN(Z$)-H)):H=100
860 R=0:L%=0:IF LEN(L$)<2 THEN RETURN
870 FOR H=1 TO 21:IF LEFT$(N$(H),LEN(
L$))=L$ THEN R=H:L%=1
880 NEXT:RETURN
890 GOSUB 840:IF L%<1 THEN PRINT"I'm
not carrying a ";L$:RETURN
900 E%=0:FOR X=1 TO 4:IF V$(X)=G$(N%(
R)) THEN V$(X)="":E%=1
910 NEXT:IF E%<>1 THEN PRINT"I'm not
carrying a ";L$:RETURN
920 B%(N%(R))=P%
930 IF R=1 AND P%=13 THEN AW=9:PRINT"
The wolf grabs it and runs away!":G$(
12)="a few bones":G$(1)=""
940 IF R=15 AND P%=18 THEN AY=9:PRINT
"The monster suddenly changes into a
 small man who thanks me for my help"
:G$(15)="":G$(9)="a small man"
950 IF R=1 THEN AB=0 ELSE IF R=3 THEN
 AC=0 ELSE IF R=6 THEN AD=0 ELSE IF R
=7 THEN AE=0 ELSE IF R=10 THEN AF=0 E
LSE IF R=11 THEN AG=0 ELSE IF R=13 TH
EN AH=0 ELSE IF R=15 THEN AI=0
960 IF R=16 THEN AJ=0 ELSE IF R=18 TH
EN AK=0 ELSE IF R=20 THEN AL=0 ELSE I
F R=21 THEN AM=0
970 IF P%=11 AND R=6 THEN P%=12:PRINT
"I drop the plank and walk across it.
No sooner do I reach the other side
than the sharks attack it and it
falls into the water!"
980 IF P%=17 AND R=18 AND AK<2 THEN A
K=6:AQ=0:PRINT"The farmer thanks me a
nd walks away  singing":G$(14)="some
dog hairs":G$(18)=""
990 RETURN
1000 PRINT"I am carrying :-":F=0:FOR
```

```
X=1 TO 4:IF V$(X)<>"" THEN F=1:PRINTV
$(X)
1010 NEXT:IF F=0 THEN PRINT"nothing a
t all!"
1020 PRINT:RETURN
1030 IF P%=1 THEN PRINT"O.K.":P%=2:RE
TURN ELSE IF P%=12 OR P%=11 THEN X$="
The sharks attack!":GOSUB 1050
1040 PRINT"I can't do that here!":RET
URN
1050 CLS:PRINTX$
1060 LOCATE 10,7:PRINT"I am dead"
1070 LOCATE 0,12:PRINT"Press the <Spa
ce Bar> to play again."
1080 A$=INKEY$:IF A$<>" " THEN 1080
1090 RUN
1100 IF AA=0 AND P%=2 THEN PRINT"I ca
n see something under the rock!":AA=1
:G$(3)="a long rope":RETURN
1110 IF P%=2 THEN PRINT"I don't think
 my back will stand the strain again!
":RETURN ELSE PRINT"I can't do that h
ere!":RETURN
1120 IF P%=9 THEN X$="An old man stic
ks his head out of thewindow and says
 'What do you want?  and he then thr
ows some boiling oil  over me":GOSUB
1050
1130 IF P%<>14 THEN PRINT"I can't do
that here!":RETURN
1140 IF AN=0 THEN AN=1:PRINT"an old l
ady opens the door and smilesat me. S
he then rushes away and dragsa small
boat out for me before closing the do
or.":G$(11)="a small rowing boat":RET
URN
1150 PRINT"There's no reply!":RETURN
1160 GOSUB 840:IF R<>3 THEN PRINT"The
re's not much point!!":RETURN
1170 IF P%<>3 THEN PRINT"Seems a stup
id suggestion to me!":RETURN
1180 IF AO=0 THEN AO=1:PRINT"The end
of the rope catches on a     on a bra
nch and I tie it firmly!":Z$="drop ro
pe":GOSUB 890:G$(3)="a rope hanging f
rom a tree":RETURN
1190 PRINT"Just how am I supposed to
do that    here? ":RETURN
1200 GOSUB 840:IF P%=3 AND R=3 AND AO
<>1 THEN PRINT"I can't!":RETURN ELSE
IF P%=3 AND R=3 THEN PRINT"O.K.  It's
hard going":P%=4:RETURN ELSE IF R=3 T
HEN PRINT"not here!":RETURN
1210 IF P%=4 THEN X$="I fall and brea
k my neck!":GOSUB 1050 ELSE IF P%=14
THEN P%=13:PRINT"O.K.":RETURN ELSE PR
INT"don't be silly!":RETURN
1220 IF P%<>7 THEN PRINT"That's a sil
ly suggestion!":RETURN ELSE IF AJ=0 T
HEN PRINT"I don't have a key !":RETUR
N
1230 PRINT"O.K.":S%(7,2)=8:AJ=2:Z$="d
rop key":GOSUB890:G$(17)=CHR$(32):RET
URN
1240 IF P%=12 THEN P%=15:PRINT"O.K.":
RETURN ELSE PRINT"Don't be silly!":RE
TURN
1250 IF P%=13 THEN PRINT"O.K.":P%=14:
RETURN ELSE PRINT"That is not possibl
e!":RETURN
1260 GOSUB 840:IF R<>7 THEN PRINT"I c
an't use a ";L$;" here!":RETURN
1270 IF AM=0 THEN PRINT"I have no woo
d!":RETURN ELSE Z$="drop log":GOSUB 8
90:PRINT"I chisel away to make some o
ars!":G$(21)="a pair of oars":N$(21)=
"oars":AS=2:RETURN
1280 PRINT"I can't do that just yet!"
:RETURN
1290 IF P%<>20 THEN PRINT"not here!":
RETURN ELSE IF AG<>1 THEN PRINT"I hav
e no boat!":RETURN
1300 IF AT=0 THEN PRINT"A giant crab
bites my toe and I rush back to the s
hore!":RETURN
1310 P%=21:IF AM=1 AND AS>0 THEN 1330
 ELSE X$="I drift away to sea and die
 of thirst":GOSUB 1050
1320 IF AL<>1 THEN PRINT"I have nothi
ng ot wear!":RETURN ELSE AT=1:Z$="dro
p boot":GOSUB 890:G$(20)=CHR$(32):AL=
3:RETURN
1330 CLS:LOCATE 0,5:PRINT"Well done.
You have managed to find  a boat and
row away from the island  to safety."
:END
1340 FOR X1=0 TO 750:NEXT X1:SCREEN 2
:LINE(0,100)-(255,191),7,BF:LINE(0,0)
-(255,99),4,BF:OPEN"GRP:" FOR OUTPUT
AS #1
1350 CIRCLE (50,20),12,11:PAINT(50,20
),11:LINE (170,100)-(255,100),2:LINE
(170,100)-(255,0),2:PAINT(250,15),2
1360 GOSUB 1450:SCREEN 0:RETURN
1370 FORX1=0 TO 750:NEXT X1:SCREEN 2:
LINE (0,0)-(255,100),7,BF:LINE(0,99)-
(255,191),2,BF:OPEN"grp:" FOR OUTPUT
AS #1
1380 SA=1
1390 FOR X=10 TO 250 STEP 20:LINE(X,1
00)-(X,0),1:NEXT X:FOR Y=10 TO 100 ST
EP 10:LINE (0,Y)-(255,Y),1:NEXT
1400 GOSUB 1450:SCREEN 0:RETURN
1410 FORX1=0 TO 750:SCREEN 2:LINE (0,
0)-(255,100),7,BF:LINE(0,99)-(255,191
),2,BF:OPEN"grp:" FOR OUTPUT AS #1
1420 SB=1
1430 LINE (100,100)-(200,50),9,BF:LIN
E (155,100)-(165,80),2,BF:LINE(95,50)
-(205,50),13:LINE(205,50)-(150,25),13
:LINE(150,25)-(95,50),13:PAINT(150,40
),13
1440 GOSUB 1450:SCREEN 0:RETURN
1450 LINE (0,180)-(255,191),1,BF:PSET
(12,181),15:PRINT#1,"Press <Space Bar
> to continue."
1460 AA$=INKEY$:IF AA$<>" " THEN 1460
1470 CLOSE #1:RETURN
```

Sound Investment



Two musical utilities strike the right note with Eric Doyle

The Programmable Sound Generator, or PSG, is well catered for by MSX BASIC but the ability to write conventional musical notation is not supported, neither is the ability to turn the computer into a keyboard synthesiser/sequencer. Two programs from Rittor Music, **Musiwriter** and **Odyssey-K**, have been designed to bridge this gap.

PSG Musiwriter is a music composer which displays the melody on stave lines. The time signature is either 4/4 or 3/4 but with the intelligent use of triplets this is not too limiting.

The screen is split into two colourful windows, the upper one displaying the bass and treble stave and the lower the menu options. It is the latter facility which shows the real strength of the package because it has not just one window of menu options but five.

The menus are split into four for selection and one for action. Selection menus are used to choose the note lengths, rhythm, accompanying chords, codas, instrument sound and comparative volumes of melody over backing. The action menu permits loading and saving of music files, output to printer, song title input and two selection facilities for time signature and the musical key.

Menu options are selected by number keys or by cycling through the options using the right and left cursor keys. Notes are positioned by the up and down cursor keys, the action key being used to place the selected note on the stave. When the piece is written, it can be modified, played and re-orchestrated until the most pleasing effect is created.

Odyssey-K defines the keys of the MSX as a dual console keyboard. The excellent introductory screen display illustrates this to an accompaniment of Scott Joplin.

At the top of the screen are two small windows. One is for option selecting while the other indicates further action to be taken according to the option chosen.

Polyphonic sound is built up a voice at a time using the REC mode. Once the melody line has been entered the harmony voices can be added in real time while the melody is played back. This is where I came across a problem with an otherwise excellent program. Admittedly the fault related to my inability to play perfectly on cue but a facility to allow small alterations to a voice would have been useful.

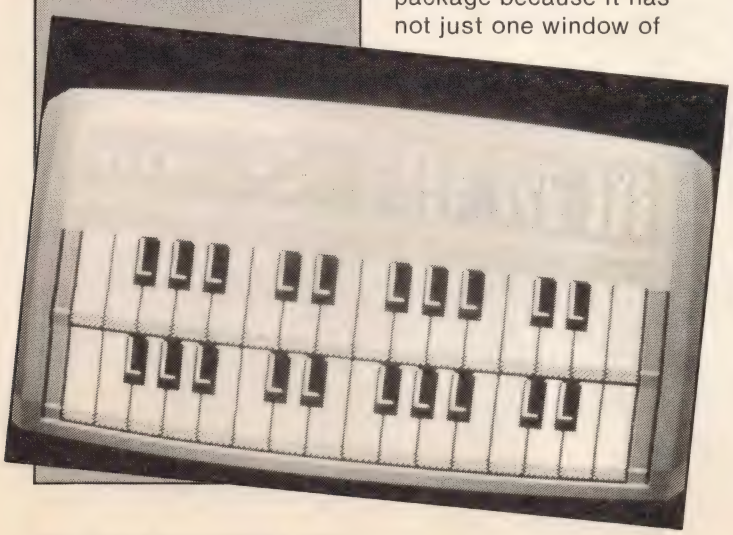
Using a computer keyboard as a musical one is not the easiest means of playing a tune and the use of the special function keys such as DEL and HME means that some of the notes may be awkwardly situated on some MSX machines. This is where the TEMPO command can be useful. Playing the tune slowly and deliberately in the REC mode can be compensated for in playback simply by increasing the speed to a normal rate. In this way the user can gain enough thinking time to find the relevant keys.

Other menu options allow changes in shape, volume, envelope and musical key; loading, saving and sequencing (reception of musical phrases) can also be selected.

Together these programs could form an attractive self-teaching music package. The booklets are clear and concise and the Musiwriter cartridge or Odyssey-K cassette are simple to use. Rittor's musical duo is highly recommended despite the rather high price tags.

MUSIWRITER
Rittor Music
£20.95
Cartridge

ODYSSEY-K
Rittor Music
£11.95
Cassette



MSX MSXplained

Graham Knight and Dick Sham have devised a utility to take the pain out of entering listings

MSXplained this month is devoted to a single program which will help readers to speed up the task of entering the various programs listed in this magazine. The program can also save a mass of different screen displays to cassette or disk and dump these screens on to an MSX printer, and it provides 26 extra single key definitions to speed up programming.

When transferring programs from a magazine on to the computer keyboard it is always best to be in capitals mode for entering all the MSX BASIC statements. Normally pressing the SHIFT key and the 1 key together would generate an exclamation mark on the screen and similarly pressing SHIFT and 2 would generate a @ character.

Pressing just the A key prints that letter on the screen but pressing the SHIFT and A key also prints the letter A and not any other character or symbol. Once the capital letter mode has been selected pressing the SHIFT key makes no difference to all the letters from A to Z. The 26 alphabetical keys give the same character whether or not the SHIFT key is also pressed.

Our program redefines these keys to make use of this otherwise redundant combination and thus gives users 26 extra function keys. Once the program has been entered correctly and RUN, pressing the SHIFT key along with any of the alphabetical keys displays a whole word or executes a complete function.

New definitions

Once the program has been RUN, pressing the SHIFT and Y key will list the 26 new definitions on the screen. Pressing SHIFT and Z will print this screen on the printer — see **figure 1**. You will notice that pressing SHIFT and A prints not an A but the letters "ASC". Similarly SHIFT and B prints "BIN$(" and SHIFT and C prints "CHR$".

Notice that the beginning of every new definition corresponds to the letters A to Z. This greatly speeds up entering programs and improves their accuracy. For example, if you want to enter a WIDTH statement all you need do is press SHIFT and W. The word WIDTH will then appear on the screen and a beep will prompt you to complete the entry.

Dump facility

Pressing SHIFT with the Z key will dump the contents of the screen on to any MSX printer. This facility is available in either screen mode one or screen mode zero. Test this DUMP facility by pressing the SHIFT and Y keys together to list the definitions on the screen and then press the SHIFT and Z keys to print this screen.

If the screen is being printed on a Sony or Toshiba MSX printer/ plotter the printing can be stopped at any time by pressing CONTROL and STOP together. Note that if the printing is being done on an MSX dot matrix printer like the Toshiba HX-P550 it cannot be

```
ASC             BIN$(
CHR$            DEFUSR=&H
ERASE           FRE(
GOSUB           HEX$(
INKEY$          INPUT$(
KEY             LOCATE
MOTORON         NEW
OCT$(           POKE&HDB44,&H
Q(SAVE)         RESTORE
SCREEN          TRON
USR(            VARPTR
WIDTH           X(EXAMINE)
Y(LIST)         Z(PRINTER)

PRESS THE SHIFT AND Y KEYS TO
LIST THE NEW KEY DEFINITIONS.

PRESS SHIFT AND Z TO PRINT THE
SCREEN DISPLAY - LIKE THIS.
```

Figure 1

terminated with the CONTROL and STOP keys as the whole screen (1K of memory) is immediately transferred to the printer's 2K buffer as soon as the SHIFT and Z keys are pressed.

The program automatically prints the correct number of characters appropriate to the screen mode. If you have a Spectravideo 80 character display or later buy an MSX 2 computer, all you have to do is press SHIFT and P to display POKE&HDB44,&H on the screen and change it to POKE&HDB45,&H1 to print 80 character screens. Entering POKE&HDB45, &H0 returns to standard screen printing.

Save to memory

Pictures can be created in screen mode 1 or 0 using any combination of the MSX characters, shapes and symbols. These screens can then be saved to memory by pressing SHIFT with Q. The default address to store the first picture is &HD600.

Several screen pictures can be created and saved to memory in different 1K blocks. These addresses can be calculated by repeatedly subtracting 1K from &HD600 — giving the sequence &HD600, &HD200, &HCE00, &HCA00 etc. In fact all the free memory can be used to store a mass of pictures but care must be taken to ensure that the 1K blocks do not overlap.

To alter the picture storing address from the initial &HD600, clear the screen and press SHIFT and P — the message POKE&HDB44,&H will show. Simply add the most significant byte of the new address after the &H and press the RETURN key. For example if you want to store a second picture just add D2 after the &H to change the address to &HD200. Clear the screen, create your next picture and save it by pressing SHIFT and Q and the new screen will be stored in memory from &HD200.

Examine pictures

Pressing SHIFT and X recalls a picture from memory. Use the SHIFT and P keys to change the current memory address to see different pictures. Pictures on the screen can then be modified and resaved to memory with SHIFT and Q.

Once a picture has been saved to memory using the SHIFT and Q command it can also be saved to cassette or disk for future use by entering:

BSAVE"PIK1",&HD600, &HD9FF

Substitute the appropriate addresses for pictures saved to other areas of memory.

Enter with care

The first six lines of the program read the machine code contained in data lines 1000-1310 into memory and then returns the user to BASIC, but with the 26 extra definitions. Great care must be taken in entering this program. Note that each of the lines from 1000 onwards contains 16 items of data separated by commas. Make sure that you don't mix up the letter O and the figure zero.

Once you have finished entering the program, remember to save it to tape before you RUN it. It is much easier to correct errors then to enter the whole program again.

PROGRAM 1

```
10 KEY OFF:CLS:AD=&HDA00
20 READ A$:IF A$="**" THEN 40
30 POKE AD,VAL("&H"+A$):AD=AD+1:GOTO 20
40 DEFUSR=&HDA00
50 A=USR(0)
60 END
1000 DATA 21,0C,DA,11,AE,FD,01,04,00,ED,B0,C9,C3,10,DA,C9
1010 DATA E5,D5,C5,F5,2A,FA,F3,7E,21,EB,0D,01,1A,00,ED,B1
1020 DATA C2,3D,DB,D6,40,21,46,DB,47,3A,EB,FB,0F,DA,3D,DB
1030 DATA E5,2A,FA,F3,36,00,E1,78,FE,19,28,55,FE,1A,CA,F3
1040 DATA DA,FE,11,28,13,FE,18,28,0F,7E,23,B7,20,FB,10,F9
1050 DATA 7E,23,B7,28,27,DF,18,F8,32,6A,DA,CD,BA,DA,2A,02
1060 DATA DB,5E,23,56,EB,ED,5B,43,DB,3E,00,FE,18,28,09,CD
1070 DATA 59,00,CD,C0,00,C3,3D,DB,EB,CD,5C,00,2A,DC,F3,CD
1080 DATA F2,0B,CD,4A,00,32,CC,FB,18,E8,7E,DF,23,B7,20,FA
1090 DATA C9,CD,27,0A,CD,E2,DA,06,0D,21,47,DB,3E,01,32,DD
1100 DATA F3,CD,8A,DA,3A,DD,F3,FE,0F,30,05,3E,20,DF,18,F4
1110 DATA CD,8A,DA,CD,E2,DA,10,E4,18,C2,CD,27,0A,21,28,00
1120 DATA 11,B3,F3,3A,AF,FC,B7,28,06,21,20,00,11,BD,F3,ED
1130 DATA 53,02,DB,54,5D,06,17,7D,32,22,DB,19,10,FD,44,4D
1140 DATA 00,C9,3E,0A,DF,3E,0D,DF,C9,3E,0A,CD,A5,00,3E,0D
1150 DATA C3,A5,00,CD,A8,00,B7,28,44,CD,BA,DA,CD,E9,DA,16
1160 DATA 00,2A,00,00,CD,4A,00,B7,20,02,3E,20,FE,20,30,09
1170 DATA F5,3E,01,CD,A5,00,F1,C6,40,CD,A5,00,38,15,14,23
1180 DATA 7A,FE,00,38,09,16,00,3A,45,DB,B7,CC,E9,DA,0B,78
1190 DATA B1,20,D1,21,F0,FB,06,50,36,00,23,10,FB,F1,C1,D1
1200 DATA E1,FB,C9,00,D6,00,00,41,53,43,00,42,49,4E,24,28
1210 DATA 00,43,48,52,24,00,44,45,46,55,53,52,3D,26,48,00
1220 DATA 45,52,41,53,45,00,46,52,45,28,00,47,4F,53,55,42
1230 DATA 00,48,45,58,24,28,00,49,4E,4B,45,59,24,00,49,4E
1240 DATA 50,55,54,24,28,00,4B,45,59,00,4C,4F,43,41,54,45
1250 DATA 00,4D,4F,54,4F,52,4F,4E,00,4E,45,57,00,4F,43,54
1260 DATA 24,28,00,50,4F,4B,45,26,48,44,42,34,34,2C,26,48
1270 DATA 00,51,28,53,41,56,45,29,00,52,45,53,54,4F,52,45
1280 DATA 00,53,43,52,45,45,4E,00,54,52,4F,4E,00,55,53,52
1290 DATA 28,00,56,41,52,50,54,52,00,57,49,44,54,48,00,58
1300 DATA 28,45,58,41,4D,49,4E,45,29,00,59,28,4C,49,53,54
1310 DATA 29,00,5A,28,50,52,49,4E,54,45,52,29,00,00,FF,FF,**
```

Starting Out

Drawing on your MSX is easy. Eric Doyle's BASIC course puts beginners in the picture

Graphics programming can be extremely satisfying and the flexibility of MSX BASIC makes light of what can be an arduous task on other computers.

The most commonly used mode for graphics is SCREEN 2 high resolution, or hi-res. But what does hi-res mean?

In the text modes 0 and 1 the smallest area which can normally be accessed from BASIC is the area covered by one complete character. On close examination it can be seen that each character is made up of smaller dots, or pixels. In fact, the whole screen is composed of a grid, or matrix, of tiny dots.

SCREEN 2 allows the programmer access to each individual pixel so that it can be turned on or off. If the pixel is turned on, it will show up on the screen as a tiny dot in the current foreground colour, assuming that this colour is not the same as the current background colour.

If the pixel is off, then it assumes the same colour as the current background.

The grid, or matrix, for SCREEN 2 measures 256 pixels across by 192 pixels down. This gives a grand total of 49152 pixels which may be either on or off and may show up in any of the 16 available colours.

A pixel may be turned on with the PSET command (Pixel SET) so if you want to see what a pixel looks like type in and RUN this little program.

```
10 SCREEN 2
20 COLOR 15,1,1
30 CLS
40 PSET(128,96)
50 GOTO50
```

Line 10 sets the screen mode to hi-res SCREEN 2 and then line 20 uses the COLOR command to set the foreground, background and border colours. The first number after COLOR is the foreground colour, the second is the background and the third is the border. Check these values with **table 1** and you should see how the resulting white on black image is derived.

Line 30 tells the computer to *CL*ear the *S*creen and in so doing the colours specified in line 20 are activated. After this a pixel in the centre of the display is switched on with the PSET command. The figures in brackets simply mean move 128 pixels across and 96 pixels down.

Line 50 may seem strange until you try running the program without it. Erase line 50 and RUN the program. Immediately the program has executed line 40 it drops out of SCREEN 2 and back into SCREEN 0 or 1, depending on which mode you were in when you typed RUN.

Macro graphics

To PSET each pixel on the screen would be time consuming and fraught with problems.

Fortunately, Microsoft have allowed for this in their extended BASIC language, and provided it with two systems which can be utilised for graphics. This month we shall concentrate on only one of them, the Graphics Macro Language (GML), because it is easier to understand.

In GML there is only one command word: DRAW. This is often followed by a string of alphanumeric characters which describe the shape of an image to be drawn on the screen. The commands are very easy to understand, so try this listing and see what happens.

```
10 SCREEN 2
20 COLOR 15,1,1
30 CLS
40 DRAW"BM50,0 R150 D150
L150 U150"
50 GOTO50
```

The first part of the DRAW string tells the computer to move to pixel co-ordinate 50,0 (50 across, 0 down) without drawing a line. BM therefore stands for Blank Move. Next we have R150 which means move right 150 pixels from the BM point, turning on each pixel as you go. Similarly, D150 means move down 150 pixels; L150 move left 150; U150 means up 150. Logical, isn't it?

In theory, the program should draw a square on the screen, but in reality the shape looks more like an oblong. This is one of the peculiarities of the graphics screen which is elongated in the horizontal plane, as it is on most micros. An easy remedy is to multiply the L to R parameters by 0.7. Change R150 and L150 to R105 and L105 and the result will look more like a square.

String-driven graphics

Previously we discussed how numbers could be

stored by a command such as A = 12: the computer reserves an area of memory, calls it A and stores 12 there. Similarly the computer can reserve an area in which a string of alphanumeric characters can be stored.

A string is denoted by the dollar symbol following the variable name. For example NAME$ could store a word such as 'Fred' in the following way: NAME$ = "Fred". Typing PRINT NAME$ would result in Fred being printed on the screen. NAME$ would read aloud as NAME string or NAME dollar — either is correct.

The next program shows how strings can be defined and used with the DRAW command.

```
10 SCREEN 2
20 COLOR 15,1,1
30 CLS
40 A$="R105"
50 D$="D150"
60 B$="L105"
70 U$="U150"
80 DRAW"BM 50,0"
90 DRAW A$
95 FOR LOOP=1 TO 500:NEXT
 LOOP
100 DRAW D$
105 FOR LOOP=1 TO 500:NEX
T LOOP
110 DRAW B$
115 FOR LOOP=1 TO 500:NEX
T LOOP
120 DRAW U$
130 GOTO 130
```

Note the delay loops which have been included to show how each part of the square is drawn. Each loop tells the computer to count to 500 before going on to the next program line. The commands could have all been written together as A$ = "BM50, OR105D150L105U150" (note the spaces between each command string are not necessary); or the strings can be concatenated, which is not as painful as it sounds. Concatenation simply means adding strings together end to end.

After RUNning the above program, enter the following command: PRINT A$ + D$ + B$ + U$. On pressing RETURN our original strings will have been concatenated into one.

Random selection

Random numbers are useful when devising graphics programs because lines of various lengths can be calculated and the unpredictable results give a different picture each time the program is RUN.

Random numbers will be dealt with in detail later in the series but I will briefly describe the principles here.

RND(– TIME) generates a random number between 0 and 1. This is converted into the range we need by multiplying by the maximum number you wish to generate and then adding 1. For example to generate a random number 1 to 6 to simulate the throwing of a dice, RND(– TIME) will give a number which is greater than 0 and less than 1, but never 1 itself. Multiply this figure by 6 to get a number between 0 and less than 6, add 1 to give a range from 1 to just less than 7.

We only need whole numbers and the command INT acts like a guillotine, chopping off the decimal part of the number, always rounding down to the nearest INTeger or whole number. This gives the required range of 1 to 6.

Seeing is believing so type NEW and enter this program which demonstrates the principles I have just described.

```
10 SCREEN 0
20 COLOR 15,4,4
30 CLS
40 FOR LOOP=1 TO 3
50 RDOM=RND(-TIME)
60 NILSIX=RDOM*6
70 WANSEV=NILSIX+1
80 NUMBER=INT(WANSEV)
90 PRINT "Random number
   ";RDOM
100 PRINT "*6 becomes
    ";NILSIX
110 PRINT "+1 gives
    ";WANSEV
120 PRINT "Chop off decim
als:";NUMBER
130 PRINT
140 PRINT
160 FORA=0 TO NUMBER*9:NE
XT A
170 NEXT LOOP
```

Press the F5 key, examine the three examples and then press F5 again.

As a final exercise try typing in Mondrian Madness which brings all this month's lessons together in one burst of colour graphics. Do not worry about the PAINT command — it simply fills in the squares with colour. We will study its use in more detail later in the series.

Next month we will delve deeper into GML commands to produce simple pictures which could be incorporated into title screens for your programs or graphics to illustrate adventures.

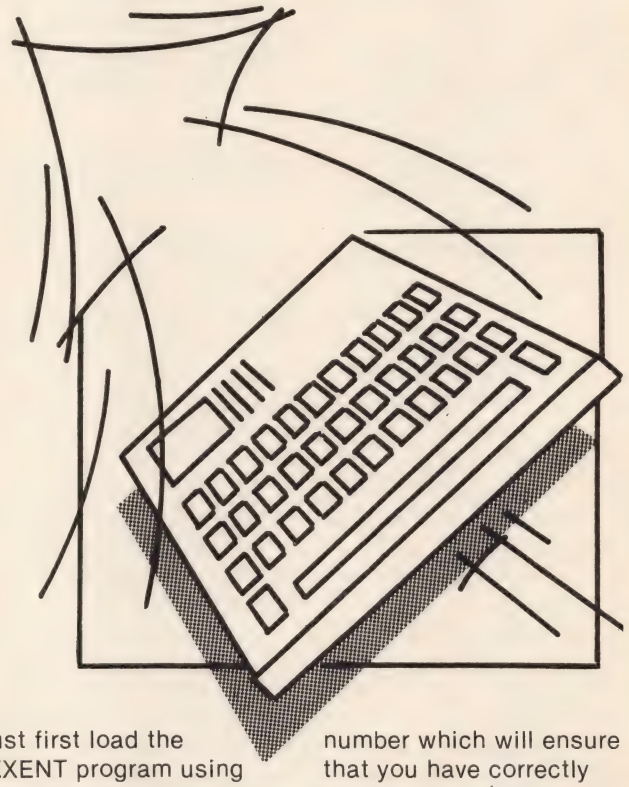
```
10 SCREEN 2
20 COLOR1,15,1
25 CLS
30 X=INT(RND(-TIME)*16)*1
6
40 Y=INT(RND(TIME)*36)*5
50 C$=STR$(INT(RND(-TIME)
*12+2)):REM choose a colo
ur between 2 and 14,then
make it a string using ST
R$
60 L=INT(RND(-TIME)*40+5)
:REM choose a length
70 L$=STR$(L):REM make it
 a string
80 LL$=STR$(L+2):REM leng
th for black box
90 D=INT(RND(-TIME)*40+5)
:REM choose a height
100 D$=STR$(D):REM make
it a string
110 DD$=STR$(D+2):REM hei
ght for black box
120 DRAW"BM"+STR$(X-1)+",
"+STR$(Y-1)+"C1R"+LL$+"D"
+DD$+"L"+LL$+"U"+DD$:REM
DRAW black box
130 DRAW"BM"+STR$(X)+","+
STR$(Y)+"C"+C$+"R"+L$+"D"
+D$+"L"+L$+"U"+D$:REM DRA
W coloured box
140 COLORVAL(C$):PAINT(X+
4,Y+4):REM fill in box in
 chosen colour
150 GOTO30
```

Value	Colour
0	Transparent
1	Black
2	Mid green
3	Light green
4	Dark blue
5	Light blue
6	Dark red
7	Cyan
8	Mid red
9	Light red (pink)
10	Dark yellow
11	Light yellow
12	Dark green
13	Magenta
14	Grey
15	White

Table 1.

Quick Answers

Steve Webb introduces a series of easy machine code routines to put sparkle into your programs.



Welcome to the first of a series of articles about machine code routines. The series is aimed at those of you who are fairly proficient at BASIC programming and would like to do something to enhance their programs without actually delving into full-scale machine code programming.

Each month I will present as many routines as space allows. Each of the routines will be fully independent and you can just use one or several to enhance your BASIC programs.

Some of the routines which will appear in future issues are screen scrolling, manipulation of the colours, sound and visual effects. I do not intend trying to teach you how to program in machine code. If you wish to do that then you will need to purchase some of the excellent books which are available, which I will mention throughout this series.

You may be asking yourself 'why do I need to use machine code routines?' The answer is simple. Machine code routines can be up to 100 times faster than their BASIC equivalent and generally use far less memory. Thus you can write far more spectacular and faster programs than you could using BASIC on its own.

Before we can see the effects of the machine code routines we need a method of actually getting them into the memory. For this purpose I have provided the following program called HEXENT which you must type in, thoroughly check, and save to tape using the following command:

SAVE "CAS:HEXENT"

When you wish to input one of the routines you must first load the HEXENT program using following command:

RUN"CAS:"

Assuming that you have correctly typed in the HEXENT listing you are now ready to input the first routine. This month I have only included one routine as you will have worn your fingers to the bone by typing in the HEXENT listing.

All the routines in the series will be presented in the following way.

Function. This will give a description of what the routine actually does.

Limitations. This will tell you under what circumstances you should or should not use the routine.

Start address of the routine.

End address of the routine. The above two addresses are very important and are used when inputting, checking and saving the routine.

Sum Check. This is a number which will ensure that you have correctly inputted the routine and will be explained later.

The actual routine will then be listed, and will consist of several rows of alphanumeric characters as can be seen from the listing of the first routine that we shall be entering.

The first routine is one to enable you to rotate characters on the screen, and I will explain in detail exactly how to enter it. First, load the HEXENT program using the following command:

RUN "CAS:"

When the program has loaded you will see a menu of options/commands. To input the routine you must first ensure that the CAPS LOCK is on. Then press key E. You will then be asked to input the start address of the routine, which in this case is 56400. The program is now ready for you to input the routine. If you look at the routines you will see that

```
10 CLEAR 200,39999!
15 SCREEN 0
20 LOCATE 0,0
25 PRINT "PUT CAPS LOCK ON."
30 LOCATE 0,4
35 PRINT "PRESS KEY E TO ENTER HEX CODE."
40 LOCATE 0,8
45 PRINT "PRESS KEY C TO CHECK HEX CODE."
50 LOCATE 0,12
55 PRINT "PRESS KEY X TO CHECK HEX TOTAL."
60 LOCATE 0,16
65 PRINT "PRESS KEY Q TO STOP."
70 A$=INKEY$
75 IF A$="E"THEN GOTO 185
80 IF A$="C"THEN GOTO 380
85 IF A$="X"THEN GOTO 100
90 IF A$="Q"THEN STOP
95 GOTO 70
100 CLS
105 LOCATE 0,0
110 PRINT"INPUT STARTING ADDRESS."
115 INPUT SA
120 LOCATE 0,5
125 PRINT "INPUT END ADDRESS."
130 INPUT EA
135 LET D=0
140 FOR C=SA TO EA
145 LET D=D+PEEK(C)
150 NEXT C
155 CLS
160 PRINT "TOTAL COUNT = ";D
165 LOCATE 0,20
170 PRINT "PRESS M TO RETURN TO MENU."
175 IF INKEY$ <> "M" THEN GOTO175
180 GOTO 15
185 CLS
190 LOCATE0,0
195 PRINT "PUT CAPS LOCK ON."
200 LOCATE 0,4
205 PRINT "INPUT START ADDRESS."
210 INPUT S
215 IF S < 40000! THEN GOTO 370
220 LET A$=""
225 LOCATE 0,23
230 LET ET =S
235 IF A$=""THEN INPUT A$
240 LET BAD=0
245 IFA$="M"THEN GOTO15
250 LET E=LEN(A$)
255 LET E=E-1
260 LET C$=A$
265 FOR D=1 TO E STEP 2
270 LET B$=LEFT$(C$,2)
275 LET C=VAL ("&H"+B$)
280 IF C = 0 THEN GOSUB 360
285 LET C$=MID$(C$,3)
290 NEXT D
295 IF BAD =1 THEN GOTO 345
300 LOCATE 0,21:PRINT S;" ";A$
305 LET B$=LEFT$(A$,2)
310 IF LEN (B$)= 1 THEN GOTO 345
315 LET C=VAL ("&H"+B$)
320 POKE(S),C
325 LET S=S+1
330 LET A$=MID$(A$,3)
335 IF A$=""THEN GOTO 230
340 GOTO 305
345 LOCATE 0,22:PRINT "INCORRECT INPUT TRY AGAIN."
350 LET S=ET
355 GOTO 220
360 IF B$ <> "00" THEN LET BAD=1
365 RETURN
370 PRINT "START ADDRESS MUST BE 40000 OR GREATER."
375 GOTO 205
380 LET ND=0
385 CLS
390 LOCATE 0,0
395 PRINT "INPUT STARTING ADDRESS."
400 INPUT SA
405 LOCATE 0,5
410 PRINT "INPUT END ADDRESS."
415 INPUT EA
420 CLS
425 IF SA+20 > EA THEN GOTO 490
430 FOR C=SA TO SA+20
435 IF PEEK (C) < 16 THEN GOTO 480
440 PRINT C;" ";HEX$(PEEK(C))
445 NEXT C
450 IF ND = 1 THEN GOTO 505
455 IF C > EA THEN GOTO 505
460 PRINT "PRESS M FOR MORE"
465 LET SA=C
470 IF INKEY$ <>"M"THEN GOTO 470
475 GOTO 425
480 PRINT C;" 0";HEX$(PEEK(C))
485 GOTO 445
490 FOR C=SA TO EA
495 LET ND =1
500 GOTO 435
505 PRINT "PRESS M TO RETURN TO THE MENU"
510 IF INKEY$ <> "M" THEN GOTO 510
515 GOTO 15
```

HEXENT listing

it consists of several pairs of alphanumeric characters. These pairs must be all inputted individually. So you can proceed by typing:

21
00
00
3E

and so on, pressing enter (or return) each time.

The final character of all the routines will always be an M which must be inputted and enter pressed. This letter M is a special code and will return the program to the menu.

The next thing to do is to check that the routine has been correctly inputted. First you must press key C. You will then be asked to input the start and end addresses of the routine to be checked. In the case of the first routine the start address is 56400 and the end address of the routine is 56471. This will then display the machine code that you have just inputted; you must carefully compare this display with the actual listing.

A final check is done by using the SUM CHECK. You do this by pressing key X while at the menu of options. You will then be asked to input the start and end addresses of the routine. After a short pause you will see a number printed on the screen, called the SUM TOTAL. The program has in fact added up the value

```
21 00 00 3E FF F5 E5 3E
08 F5 CD 78 DC F1 23 3D
C2 59 DC E1 E5 13 EB 01
08 00 CD 5C 00 E1 01 08
00 09 F1 3D C2 55 DC C9
11 62 F2 CD 4A 00 47 3E
08 F5 CD 8F DC F1 3D C2
81 DC C9 CD 4A 00 47 1A
CB 10 CB 17 12 1B C9 05
M
```

ROUT 1

of all the bytes of the routine which you have just inputted. If the number printed does not correspond to that given at the start of the listing then you will need to re-input the routine.

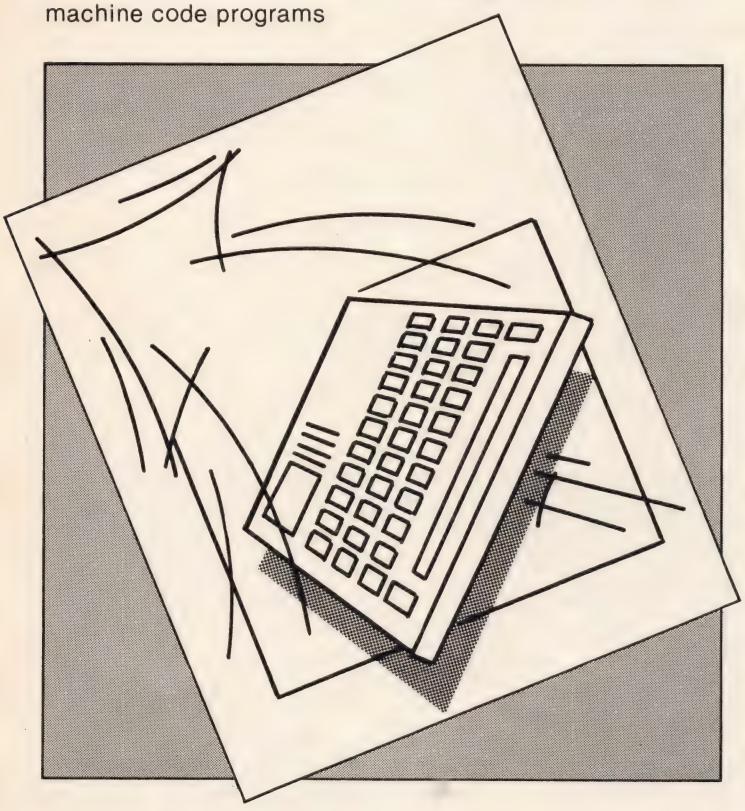
All this checking is very important, because unlike BASIC which will just stop if it contains an error, machine code programs will cause the machine to lock up if they go wrong, in which case you will have to switch the computer off and on and reload everything.

Now that you are certain that the routine has been inputted correctly you can save it to tape. To do this you must press Q while at the menu, which will cause the HEXENT program to stop. The routine can then be saved using the following command.

BSAVE "CAS:NAME", Start Address, End Address.

In the case of the first routine you would type the following;

BSAVE "CAS:ROUT1", 56400,56471



I advise you to save the routine at least twice and if possible onto different tapes. This will prevent you from having to reinput the routine if you lose or damage one of the tapes.

The first routine is presented in the way that all routines will appear.

Name. ROUT1

Function. By accessing this routine the shapes of all the characters will be rotated through 90 degrees. So, by accessing the routine once, all the characters will be turned on their sides. Access the routine a second time and the characters will be upside down. Accessing the routine a further two times will restore the characters to their former glory. This routine could be used to write text sideways on the screen.

Limitations. Use only in screen mode 1.

Start Address: 56400

End Address: 56471

Sum Check: 8491

I will now show you how to use a routine which has been saved on to tape. Turn your computer on and type the following:

CLEAR 200,56000

The above command creates a software barrier above which the routines can safely be kept without fear of being over-written by your BASIC programs. Now load the routine using the following command.

BLOAD "CAS:NAME"

In the case of the first routine you would type BLOAD"CAS:ROUT1" Now you can load or type in any of your BASIC programs that wish to take advantage of this routine.

To access a routine you must use the DEF USR function. This is best explained by the following example.

DEF USR = 56400.

This says that the routine that you wish to access starts at location 56400

A = USR (0)

This actually accesses the routine which will then be executed. And if all is well you will see all the characters rotated on their sides.

The principles involved in inputting, checking, saving to tape and running all the routines is always the same; only the numbers are changed to protect the guilty. Keep this article handy if you wish to input any of the future routines because I do not want to waste time or space by continually explaining the same thing.

If you have any questions or would like me to include a particular routine in the series do not hesitate to write to me.

See you next month.

Steve Webb is the author of Useful Utilities for your MSX and of Practical MSX Machine Code Programming.

Your Local MSX Software Stockists

Software City

The UK's No. 1 Software dealer Limited. Programs, peripherals, disks and accessories, plus a selection of books and magazines.

382 Kings Road
Chelsea SW3
Tel: 01-352 9220

14 Thames Street
Kingston-Upon-Thames, Surrey
Tel: 01-541 4911

47 Cheap Street
Newbury, Berks RG14 5BX
Tel: 0635 31696

WARD AND WILLIAMS LTD

Romiley, Cheshire.
Tel: 061-430 2934

Over 50 different titles in stock.

FRENCH

52 Dordan Road
Dordan
Tamworth, Staffs
Tel: (0827) 892252

COLLINGWOODS TV SERVICES

Northamptons largest range of MSX software. Also stockists of Mitsubishi, Sanyo and Goldstar MSX computers, light pens, joysticks, Data Recorders and colour monitors.

17 Collingwood Road, Northampton.
Tel: (0604) 714770

R & J TELEVISIONS

8 Summer Street,
Lostwithial,
Cornwall PL22 0DH
Tel: (0208) 872103

Contact us for all your MSX software needs.

J. KOCZUR

185 Yorkshire Street,
Rochdale,
Gtr Manchester.
Tel: (0706) 42107

SUDBURY MICRO SYSTEMS

64 North Street, Sudbury.
Tel: (0787) 311839

Excellent selection of MSX software, joystics, books. etc.

ELECTRICAL DISCOUNT CENTRE

138 Pelham Road,
Gravesend,
Kent Da11 0JH
Tel: (0474) 26600

J & H RUSSELL

(Kidderminster Ltd)
21-22 Coventry Street,
Kidderminster,
Worcestershire.
Tel: (0562) 2686

HOWES OF SOUTHBOROUGH LTD

Tunbridge Wells,
Kent.
Tel: (0892) 28682/37288

REYNOLDS COMPUTER CENTRE

79 Orsett Road,
Grays,
Essex RM17 5NH
Tel: (0375) 5948

PORTOGRAM

212 High Street
Barnet
Hertfordshire
Tel: (01) 449-4183

MSX in Birmingham

BULLOCKS HI-FI AND VIDEO

884 Washwood Heath Road
Ward End,
Birmingham B8 2NB
Tel: 021-783 2809
Contact: Matthew Bullock

MSX in Cheshire

SWIFT OF WILMSLOW

St Anns Parade,
Wilmslow, Cheshire.
Tel: (0625) 526213

GAMER

71 East Street,
Brighton.
Tel: (0273) 728681

S.P. ELECTRONICS

48 Linby Road,
Hucknall, Nottinghamshire.
Tel: (0602) 640377

PATERSONS

6 Hamilton Place,
Edinburgh.
Tel: 031-225 1771

Is your county represented — if not why not?

GAMESMANSHIP

PROUDLY PRESENTS FOR THE MSX

TITLE	R.R.P.	OURS	TITLE	R.R.P.	OURS
*DECATHLON	11.99	6.95	Boulderdash	6.95	5.90
Minder	9.95	8.50	Red Moon	9.95	8.50
The Wreck	14.95	13.50	Pineapplin	7.95	6.95
Ghostbusters	11.99	10.50	The Hobbit	14.95	13.50
Le Mans	9.95	8.50	Sorcery	8.95	7.75
Snowball	9.95	8.50	Return to Eden	9.95	8.50
Zaxxon	11.95	10.50	Buck Rodgers	11.95	10.50
Flight Path 737	7.95	6.95	Ninja	6.95	5.95
Manic Miner	7.95	6.95	Jet Set Willy	7.95	6.95
Chuckie Egg	7.95	6.95	Les Flics	7.95	6.95
Wongs Loopy Laundry	8.00	6.95	Disk Warrior	7.90	6.90
Colossal Adventure	9.95	8.50	Emerald Isle	6.95	5.95
Back Gammon	9.95	8.50	Super Chess	8.95	7.75
Nopro (Word Processor)	29.95	27.00	Home Budget	14.95	13.50
KONAMI ROMS			**HAL ROMS**		
Kie Ar Kung Fu	17.40	16.00	Hole in One	14.95	13.50
Sky Jaguar	17.40	16.00	Rollerball	14.95	13.50
Tennis	17.40	16.00	Super Billiards	14.95	13.50
Mopiranger	17.40	16.00	Mr Ching	14.95	13.50

GAMESMANSHIP, 65 Casslobury Ave, Bedfont, Middlesex TW14 9JE for friendly service. Ring 01-890 5636. 9.00a.m.-9.00p.m. Guaranteed originals post/packing inclusive. Overseas orders welcome. Europe 50p per tape. Elsewhere £1.00 per tape. No surcharges.
*Subject to availability.

UnitSoft (MSX)

AFFORDABLE PRODUCTS UNIT 6,
136 INGRAM STREET, GLASGOW G1

MSX

Bolderdash	£6.00
A View To A Kill	£8.00
Elidon	£6.00
Lazy Jones	£7.50
Roller Ball	£12.00
Hole In One	£12.00
Wonderbolt	£9.25
Eddie II	£21.00
Ninja	£5.25
Star Seeker	£7.75
Red Moon	£5.95
Colour Fantasia	£7.75
Vicious Viper	£4.95
Shark Hunter	£6.95
Dog Fighter	£5.25
Star Avenger	£6.95
Anty	£5.25
Ghostbusters	£8.75
Decathlon	£7.75
Beamrider	£7.75
Zenji	£7.75
Pitfall II	£7.75
River Raid	£7.75
Mr Wong's Laundry	£6.25
Blagger	£6.25
Flight 737	£7.75
Chuckie Egg	£5.25
Time Bandits	£6.25
Colossal Adventure	£7.75
Adventure Quest	£7.75
Dungeon & Adventure	£7.75
Lords of Time	£7.75
Snowball	£7.75
Return to Eden	£7.75
The Hobbit	£10.00*
Jet Set Willy	£6.25
Hero	£9.25
Zaxxon	£9.25
Buck Rogers	£9.25
Sorcery	£7.50
Emerald Isle	£5.25
Pshydelia	£5.25
Special Operations	£5.25
Disc Warrior	£6.25
Le Mans	£7.50
Crazy Golf	£6.25
Punchy	£6.25
Hunchback	£6.25
Manic Miner	£6.25
Eric And The Floaters	£4.95
Fire Rescue	£6.25
Hot Shoe	£4.95
Hustler	£5.25
Oh Mummy	£4.95
Panic Junction	£5.25
The Wreck	£11.25*
Panzer Attack (new)	£6.25
Classic Adventure (new)	£5.25
3D Golf (new)	£6.25
Pinball (new)	£6.25
Polar Star (new)	£6.25
Piramids Warp (new)	£6.25
The Snowman (new)	£6.25
Booga-Boo (The Flea) (new)	£6.25

KONAMI ROM CARTRIDGES
All £14.75

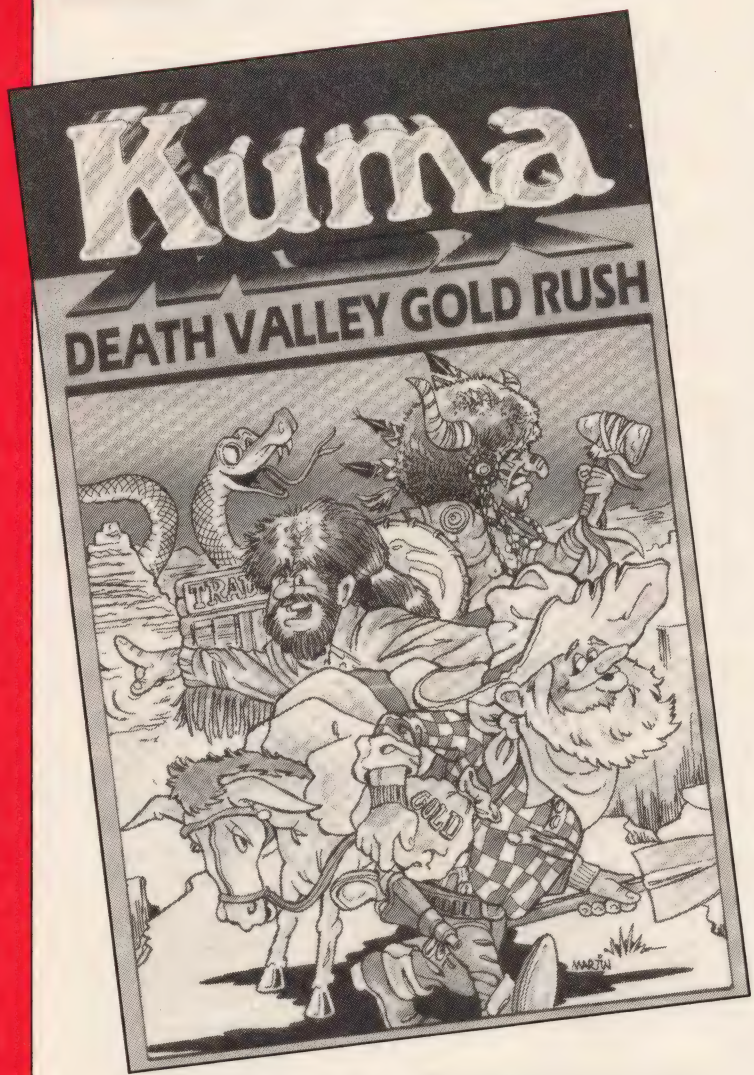
Tennis
Golf
(New) Ping Pong
Antartic Adventure
Monkey Academy
Track and Field I
Track and Field II
Hyper Sports I
Hyper Sports II
MOPI Ranger
Yier Kung-Fu £14.25*
Kings Valley
Sky Jaguar
Circus Charlie
Athletic Land
(New) Time Pilot
(New) Comic Bakery
(New) Super Cobra
(New) Hyper Rally

PERIPHERALS

Quick Disk	x£115.00
RB II Tracker Ball	x£85.00
Joy Card	£6.25
Konami's Hypershot	£14.25
MSX Quickshot I	£7.00

*While stocks last xOperating Software included.
Postage included UK. Overseas orders add £1.00 per item. All cheques payable to: Affordable Products

Steve Lucas's trail of exploration leads through three new games from Kuma



DEATH VALLEY GOLD RUSH
Kuma
£7.95
Cassette

Since last month, I've managed to find time to have a go at three more adventures from Kuma.

In **Death Valley Gold Rush**, you have inherited the deeds to the old Adams mine near to Death Canyon. After much travelling, you arrive in the town tired and weary with only $50, so you need to beg, borrow or steal extra money in order to buy equipment to go prospecting in the surrounding countryside.

The locals are a pretty mean bunch and will overcharge you whenever they can, so you must keep a tight grip on your purse. Your task is to try to find the motherload. A small card of hints is provided with the game and this gives you such clues as 'Start by exploring the town so that you know where to find the stables, bank, assay office, store, saloon etc.' Kuma really do give a lot away.

Your first aim is to survive by finding and selling gold dust. After several days of mining, you should have sufficient capital to finance longer expeditions to find greater riches in the mines themselves.

My first impression of the game was one of disappointment. The screen display is almost identical to that of Kuma's **Shadow of the Bear**, which I reviewed last month, right down to the dreadful tune playing continuously through the title and instruction screens.

Like Shadow of the Bear, this game is written in BASIC, although the CONTROL and STOP keys are disabled during play to prevent cheating by examining the listing. Each location visited is accompanied by a picture, and although the quality of the graphics is not particularily impressive, they are drawn in quite fast.

My impressions of Shadow of the Bear were marred by the non standard format in which instructions must be given to the computer and the same comments apply equally to this game, although I am beginning to get used to it. From the graphics screen, pressing the N, S, E, W, U or D keys will move you in the appropriate direction if possible.

There is no indication in the description on the screen of the directions in which you can move, so it becomes even more important to keep an accurate map of your progress. The graphics screen displays the picture, a short description of the location and your current inventory of things like items carried and loans outstanding.

Any other instructions apart from movement in the prime compass directions must be given from the text screen and movement between the two screens is achieved by

pressing I for the text screen, and R to return to the graphics screen. The text screen too displays the current inventory but no mention of your current location.

The vocabulary recognised is very limited when compared to many adventures and words not recognised can produce some very strange and unexpected, messages such as 'Do you collect stamps?', 'You're backing a loser' and 'Oh my keys hurt!'. These messages seem to be chosen at random and are accompanied by a short, and very irritating, little tune.

I must admit that sound in an adventure can be very exciting, adding atmosphere and increasing the playability, but in this game, there is little attempt to make use of sound effects when you try shooting your gun, just an endless repetition of a simple tune. Thank goodness you can turn the sound off.

Perhaps I'm getting a little more used to this format, because I've quite enjoyed playing this game. My progress has been good, and I've made quite a bit of money.

This adventure is something of a mix between a traditional adventure and a trading game but doesn't quite have the appeal of either. By far the best trading game I've come across is **Elite** for the BBC B and shortly for other micros. Let's hope that we see an MSX version before too long.

'Not that tune again!' I thought, as I watched the title screen of **Galactic Mercenaries**. Still, we shouldn't be too harsh in judging a game by the choice of tune accompany the titles. Messrs D and J Amies have obviously written these games using a standard format.

Galactic Mercenaries is, again, written in BASIC with the CONTROL and STOP keys disabled. Instructions must be typed in capital letters, a message to that effect being displayed immediately after the title screen. The paper and border colours have been changed, but the titles and instructions are much as before.

In the year 2400 AD, your home planet, Earth, is attacked and invaded by evil aliens. You and a small crew take off in the only hyper-light space craft on earth to seek help to liberate your planet. Once you can find them, most planets are inhabited, but they will require something before they give you any assistance.

You will need to search all the planets visited to find the items to be traded and you should never give up hope, for things may appear even after you have searched a planet. Your position in space is shown by sector, quadrant and dimension. It is wise to remember these positions as they will all change in every new game.

This game is something of a cross between an adventure and Star Trek. As well as the adventure element, it is a test of memory and observation, so you will need a large sheet of paper, a pencil and a rubber. Once you've started the game, you will need to carry out a full search of each quadrant, sector by sector, to create a full map of the galaxy.

On your journey through the galaxy keep watch for alien space craft. Some are lethal, others are not, and you must be very observant. Movement from one sector to the next is achieved automatically by pressing the cursor key in the direction you want to move. Other commands are achieved by moving from the graphics to text screen in a similar way to the last game (ie pressing I and R keys).

In the text screen, you can use many of the familiar commands such as GET, LAND and GIVE.

Instructions should be given in two-word sentences. Fuel and laser power are factors which limit your ability to move through the galaxy. There are a number of planets where you can refuel your spaceship, but only one place where you can recharge the batteries for your laser.

Each game you play is a totally new adventure, so if you want to continue with the game you are playing rather than starting a new one, you will have to make full use of the save game facility.

Despite using the same format of screen display as Death Valley Gold Rush, this program has proved to be far more addictive. The graphics for each sector are well done, making full use of sprite graphics, and the sound of your spaceship's motors is very convincing. The authors have managed to take two very successful traditional computer styles and merge them into a most enjoyable program. I have never come across a mix of adventure with Star Trek before and the blend makes for a pleasant change.

GALACTIC MERCENARIES
Kuma
£7.95
Cassette

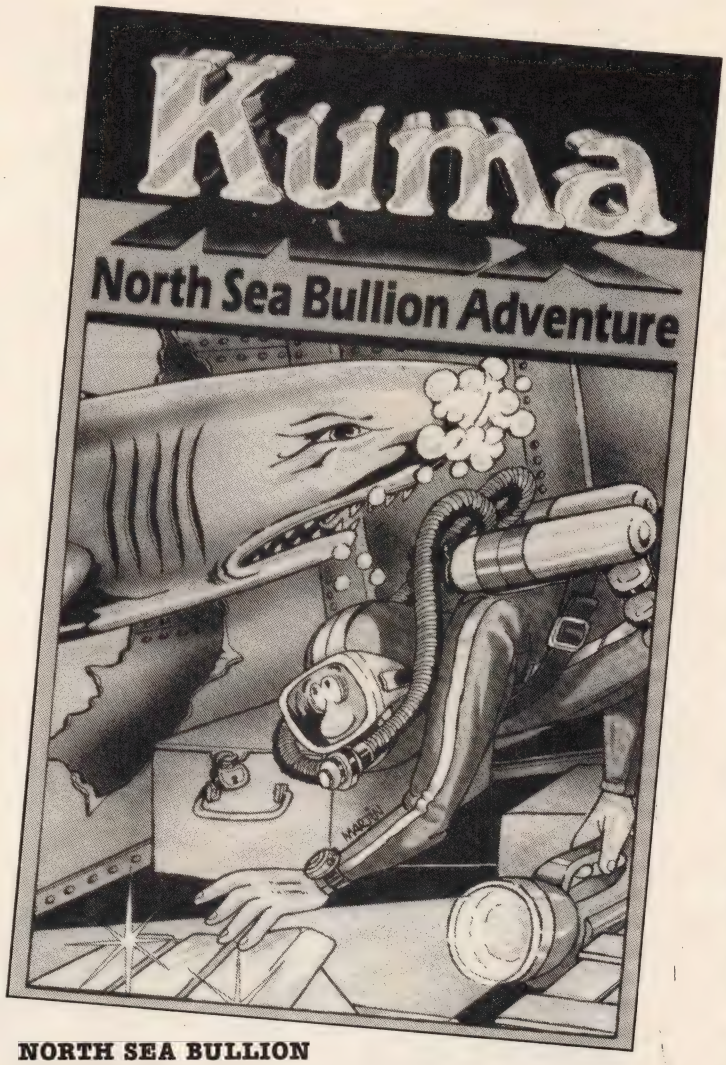
By the time I'd heard the same dreadful tune again at the introduction to **North Sea Bullion Adventure**, I was beginning to feel like throwing the TV set out of the window, except for the fact that I've just bought it.

In this game, you take on the role of the captain of a salvage tug in search of the wreck of a World War II destroyer loaded with gold bullion. She is reputed to have gone down in or near arctic waters and your task is to find her and raise the cargo in the short arctic summer. The exact location of the gold can be found from the captain's log, which is supposed to be in his wall safe. Your first task, therefore, will be to find his log.

This is a three-dimensional game which uses the same method of giving instructions as the other two under review. Movement is achieved automatically from the graphics screen using the cursor keys to move N,S,E and W, whilst the U and D keys take you up and down respectively. Further instructions must be given from the text screen as in the other games by Messrs D and J Amies

Most of the commands should be familiar to ardent adventurers, but for some strange reason the authors have chosen to use the word LIST rather than the familiar INVENTORY. In addition, the word LOOK reveals what has been left in that location instead of giving a complete description. The game does incorporate the facility to save your position. Before leaving the home port, you will need to purchase fuel and oxygen.

From the graphics screen, you are given a constant display of your money, fuel, cylinders, days and temperature,



NORTH SEA BULLION ADVENTURE
Kuma
£7.95
Cassette

while underneath the picture there is a short description of the location. My first problem with this game was communicating with the computer. It allowed me to BUY OXYGEN, but not BUY FUEL, so I hurriedly tried REFUEL, FILL TANKS, GET FUEL, all to no avail. In most cases, the response was just the simple 'You can't', but the response to my instruction GET FUEL was 'Not in this game you don't. It's bad grammer'.

'If only I'd read the instructions more carefully,' I thought. After several attempts, I gave up, read the instructions and found that I had to BUY FUEL OIL. It is a pity that the game isn't a bit more generous in the vocabulary it accepts, as it does tend to put the player off when an adventure refuses to accept what seem to be logical instructions.

Another annoying feature of this game is that it doesn't tell you all the things that you need to know. The instruction card, for instance, advises you that you need to buy fuel, oxygen, steel plate, a spear gun, a diving lamp and a gas torch before setting sail, but nowhere does it tell you what is available for sale.

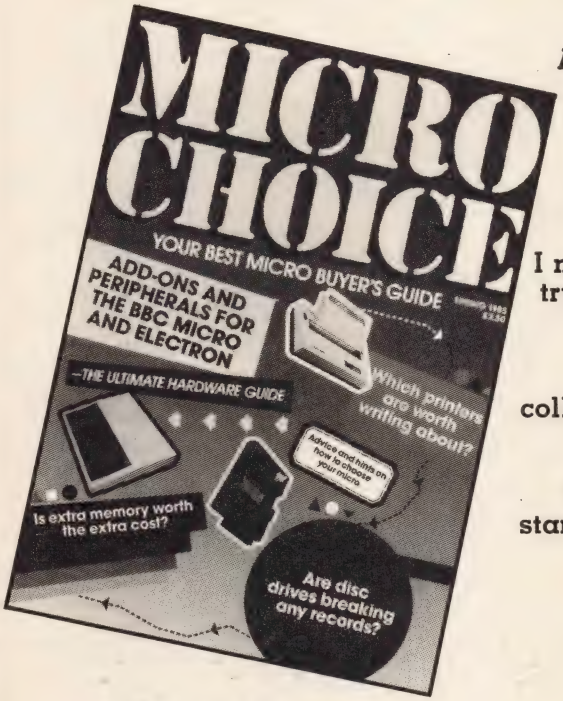
Once you know what items are available for sale and the instructions needed to get them, the game becomes quite good fun. There are a number of nice features about it. If you want to buy three oxygen cylinders, for example, all you need to do is type BUY OXYGEN and press the RETURN key three times. On your journey, you can mark any location with a buoy, which is also on board, but will need to keep a close watch on your fuel supply, battery power, temperature and oxygen cylinders. Many of the location have no description at all, presumably because you are at sea.

One of the most unusual features of this game is that it has no set ending. It is left up to you, the captain, to decide when you have succeeded. That may be when you have discovered the strong room and returned to your ship with a gold bar, or you could go on removing gold bars, one at a time, to see how many you can recover and return to port. There are so many good ideas in this game that it is a pity that it has a number of minor problems.

Of the three games I have looked at this month, the only one I can honestly say I enjoyed was Galactic Mercenaries and even that was spoilt by the terrible tune at the beginning. The other two contain some good ideas and should not be dismissed out of hand, but they are really not up to the standard of the best adventures and would rate about 5/10 for playability.

With so few MSX adventures about, Kuma have little competition, except from Melbourne House and Level 9. When sales of MSX machines increase, as they surely must, and more software houses start to support the MSX standard, Kuma will need to produce better games than these if they are to compete. In the meantime, you should find Galactic Mercenaries an excellent way to while away the time.

You cannot be serious!!


MICRO CHOICE
YOUR BEST MICRO BUYER'S GUIDE
ADD-ONS AND PERIPHERALS FOR THE BBC MICRO AND ELECTRON
—THE ULTIMATE HARDWARE GUIDE
Which printers are worth writing about?
Advice and hints on how to choose your micro
Is extra memory worth the extra cost?
Are disc drives breaking any records?

About software, that is! Or at least you can't until you've made an intelligent decision about hardware.

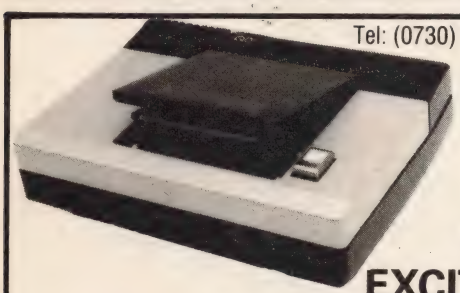
Computers? Printers? Disc drives? Joysticks? Peripherals? Extra RAM?

I mean, there's a serious danger of going crazy just trying to understand the choices. Let alone coming to an intelligent decision.

Micro Choice is your answer. Every quarter it collects a range of hardware reports so that you can make your own choice of micro or add-ons.

Then you can forget about being too serious and start having fun. Easy when you think about it, isn't it?

MICRO CHOICE



Tel: (0730) 895273 MICRO/LINK Tel: (0730) 895296

PROUDLY PRESENT THEIR EXCITING NEW PRODUCTS FOR YOU THE MSX USER

HARDWARE

QUICK DISK DRIVE . . . £

The first real alternative to Micro-Cassettes.....**138.00**

(Software now being developed for this Quick Access Drive).

PRINTERS . . . £

J.P. 100a (100CPS-80COL) **199.00**
J.P. 130a (130CPS-80COL) **229.00**
J.P. 136a (130CPS-136COL) **389.00**
M.C.P. 80 (4 Colour Printer Plotter) **179.00**

Hardware prices are exclusive of VAT

Software prices are inclusive of VAT

Please tick the MSX Software required.

SOFTWARE

TITLES . . . (incl. VAT) £

- ☐ ERIC & THE FLOATERS **5.95**
- ☐ DRILLER TANKS **8.95**
- ☐ BINARY LAND **8.95**
- ☐ BEAN RIDER **11.99**
- ☐ GHOSTBUSTERS **11.99**
- ☐ MANIC MINER **7.95**
- ☐ STOP THE EXPRESS **6.95**
- ☐ DOG FIGHTER.....**6.95**
- ☐ NINJA **6.95**
- ☐ JET SET WILLY **6.95**
- ☐ ANT ATTACK **7.95**
- ☐ HYPER VIPER **7.95**
- ☐ SUPER DOORS **8.95**
- ☐ NUTS & MILK **8.95**
- ☐ MAH NONG CRAZE.....**8.95**
- ☐ FIRE RESCUE **7.95**
- ☐ SUBMARINE SHOOTER.....**8.95**

PICK *ANY* 4 TITLES AND GET *1* **FREE**

TITLE FREE £

☐ _____ No charge

BEAMSTICK £

FED UP WITH SPAGHETTI JUNCTION COMING OUT OF YOUR MSX? MICRO/LINK HAS SOLVED YOUR PROBLEM WITH THIS REVOLUTIONARY FAST ACTION, TWIN FIRE, INFRA-RED JOYSTICK .....Circa! **39.95**

ONLY

JOYCARD.....**8.95**

☐ **ORDER** **ENQUIRY** ☐

Name:_____

Address:_____

_____

Telephone:_____

Cheque/Postal Order made payable to:

MICRO/LINK

Software £1.00 p&p (Total) £.....

Hardware £3.00 p&p (Total) £.....

"BOWYERS", STEEP MARSH LISS, HANTS. GU32 2BJ

Contact

A

ACTIVISION, 15 Harley House, Marylebone Rd, London, NW1:

Ghostbusters
Beamrider
Decathlon
Pitfall II
River Raid
H.E.R.O.
Games — £11.99 each

A&F SOFTWARE, 8 Canalside Ind. Estate, Woodbine St East, Rochdale:

Chuckie Egg — game — £7.90

ALLIGATA, 1 Orange St, Sheffield, S1 4DW:

Blagger — game — £7.95
Contract Bridge — game — £9.95
Disc Warrior — game — £7.95

ANIROG, 8 The High St, Horley, Surrey, RH6 7AY:

Flightpath 737 — game — £7.95

ARTIC, Brandesburton, Driffield, North Humberside, YO25 8RL:

Mr. Wongs Loopy Laundry — game — £6.95

A.S.K., London House, 68 Upper Richmond Rd, London, SW15 2RP:
Number Painter — educational, 5-14 years — £8.95

B

BUBBLE BUS, 87 High St, Tonbridge, Kent, TN9 1RX:

Hustler
Boardello
Games — £6.99 each

C

CABLE SOFTWARE
Cape House, 52 Limbury Rd, Luton, Beds LU3 2PL

Sprite Editor — utility — £7.95
Graphic Designer — utility — £14.95

CDS MICROSYSTEMS, Silver House, Silver St, Doncaster, Sth Yorkshire:

French is Fun
German is Fun
Italian is Fun
Spanish is Fun
Educational — £7.95 each

COMPUTER MATES, PO Box 2, Stockbridge, Hampshire:

Word Processor — business — £49
Cards System — business — £49
Cash Accounts System — business — £99
Double Entry Accounts — business — £99
Word Processing & Cards System combined — business — £75
RS232 Communications — utility — £229.99

D

DK'TRONICS, Unit 6, Shirehill Industrial Estate, Saffron Walden, Essex CB11 3AQ

Minder
Popeye
Games — £9.95 each

E

ECLIPSE, Longman House, Burnt Hill, Harlow, Essex CM20 2JE

Oh Mummy!
Hot Shoe
Games — £5.95

ELECTRIC SOFTWARE, 91 High St, Longstanton, Cambs.

The Wreck — game — £14.95
Buzz Off — game — £8.95
Shark Hunter — game — £8.95
Norseman — game — £8.95
Backgammon — game — £9.95
Zaxxon — game — £11.95
Buck Rogers — game — £11.95
Le Mans — game — £9.95

H

HAL LABORATORIES
Maple Walk, Bexhill, E. Sussex

Hole in One
Mr Ching
Rollerball
Super Billiards
Super Snake
Step Up
Games — £14.95 each

HI-SOFT, 180 High St Nth, Dunstable, Beds, LU6 1AT:

Devpac — utility — £19.95
Pascal Compiler — utility — £29.95

K

KEMP, 43 Muswill Hill, London, N1D 3PN:

Stock Control — business — £34.95

KNIGHTS TV & COMPUTERS, 108 Rosemount Place, Aberdeen

Othello
Cave Adventure
Exploding Atoms
Smash Out

Vicious Viper
Games — £5.95 each
Typing Tutor — business £5.95
Budget Accounts — business £28.75
Junior Maths — educational £5.95
MSX Basic Tutorial — education £16.95
MSX demonstrator — utility £5.95
Machine Code Language — utility £28.75
MSX Graphics — utility £5.95

KONAMI, Television House, 269 Fieldend Rd, Eastcote, Middlesex:

King's Valley
Sky Jaguar
Super Cobra
Athletic Land
Circus Charlie
Antarctic Adventure
Comic Bakery
Monkey Academy
Mopiranger
Time Pilot
Hyper Olympic 1, Hyper Olympic 2
Hyper Sports 1, Hyper Sports 2
Yie Ar Kung-Fu
Golf
Tennis
Games — £17.40 each

KUMA, 12 Horseshoe Park, Pangbourne, RG7 7JW:

Binary Land — game — £8.95
Eric & The Floaters — game — £8.95
Hyper Viper — game — £7.95
Spooks & Ladders — game — £6.95
Holdfast — game — £5.95
Home Budget — business — £14.95
WDPRO-Wordprocessor — business — £29.95
Database — business — £19.95
Star Avenger — game — £8.95
Super Chess — game — £8.95
Stop The Express — game — £6.95
Ninja — game — £6.95
Mean Streets — game — £6.95
Colour Fantasia — game — £9.95
Logo Turtle Graphics — £19.95
Spreadsheet — £29.95
Zen Assembler — disk
Kuma Forth — disk — £39.95 each
Darkwood Manor — game — £7.95
North Sea Bullion — game — £7.95
Shadow of the Bear — game — £7.95
Galactic Mercenaries — game — £7.95
Death Valley Goldrush — game — £7.95
Coco in the Castle — game — £6.95
Galaxia — game — £6.95
Dog Fighter — game — £6.95
Fire Rescue — game — £7.95
Driller Tanks — game — £8.95
Cribbage — game — £5.95
Communications — utility — £19.95

L

LEVEL 9 COMPUTING PO Box 39, Weston-Super-Mare, Avon BS24 9UR

Colossal Adventure
Adventure Quest
Dungeon Adventure
Snowball
Return to Eden
Lords of Time
Games — £9.95 each
Emerald Isle
Red Moon
Games — £6.95 each

LLAMASOFT, 429 Mt Pleasant, Tadley, Hants:

Psychedelia — game — £5

LOTHLORIEN, 56A Park Lane, Poynton, Stockport, Cheshire, SK12 1RE

Special Operations — game
Panzer Attack — game
£7.95 each

M

MASTERTRONIC, Park Lorne, Park Rd, London NW8 7JL:

Space Walk
Finders Keepers
Games — £1.99 each

MEGACYCAL SOFTWARE, PO Box 6, Birkenhead, Merseyside L43 6XH

Gods of the Tomb — game — £9.20
Gumshoe Logic — game — £9.20
Revise Physics — educational — £8.50
Teach yourself Electricity — educational — £9.20

MELBOURNE HOUSE, Castle Yard House, Castle Yard, Richmond TW10 6TF

The Hobbit — game — £14.95
Classic Adventure — game — £6.95

MICRO-AID, 25 Fore St, Praze Camborne, Cornwall, TR14 0JX:

Cashbook — business — £14.95
Memo-Calc — business — £14.95
Payroll — business — £29.95

MR MICRO, 69 Partington Lane, Swinton, Manchester, M27 3AL:

Punchy
Humphrey
Cubit
Crazy Golf
Zakil Wood
Games — £7.95 each

MIRRORSOFT, Holborn Circus, London ECP 1DQ:

737 Flight Simulator — game — £9.95
First Steps with the Mr Men — educational — £8.95
Star Seeker — educational — £9.95

MORWOOD, Maple Walk, Bexhill, East Sussex:

Anty
Cannon Fighter
Panic Junction
Super Mind
Super Maze
Super Puzzle
Games — £6.95 each
Fairy
Pineapplin'
Games — £7.95 each

Introduction To Numbers
Calculation 1
Calculation 2
Memory
Reasoning
Reflexes
Educational — £9.95 each
P.I.C.A.S.S.O. — utility — £7.95

O

OCEAN SOFTWARE, 6 Central Street, Manchester M3 5FD

Hunchback — game — £6.90

ORPHEUS SOFTWARE, The Smithy, Church Farm, Hatley St George, Sandy, Beds SG19 3HP

Boulderdash — game — £6.95

P

PANASONIC (UK) LTD, 300-318 Bath Rd, Slough, Berks

Golf — game
Starship Simulator — game
Marine Battle — game
Breakout — game — £18.80
Highway Star — game
Squish 'em — game
MSX-21 — game
Tele-bunnies — game

PSS, 452 Stoney Stanton Rd, Coventry, CV6 5DG:

Champ — utility — £12.95
Maxima
Time Bandits
Les Flics
Games — £7.95 each

Q

QUICKSILVA, Liberty House, 222 Regent Street, London, W1R 4DB

Games Designer — utility — £9.95
Ant Attack
The Snowman
Fred
Booga-boo
Games — £7.95 each

R

RITTOR MUSIC, 24 Broomsgrove Gdns, Edgware, Middlesex

PSG Musiwriter — utility — £20.95
Odyssey-K — utility — £10.95

S

SOFTCAT, Woodbridge Rd Derby Green, Blackwater, Camberley, Surrey:

Let's go MSX
Challenge My Bluff
Kriss Kross Kquiz
Fun Words — educational — £9.95 each

SOFTWARE PROJECTS, Bear Brand Complex, Allerton Rd, Woolton, Liverpool, L25 7SF:

Manic Miner
Jet Set Willy
Games — £7.95 each

SONY, Sony House, South St., Staines, Middlesex

Juno First
Battle Cross
Crazy Train
Mouser
Dorodon
Games — £17.95
Home Writer — business — £24.95

STELL SOFTWARE, 36 Limefield Ave, Whalley, Lancs

Maths Invaders — educational — £7.95

T

TERMINAL SOFTWARE, Derby House, Derby Street, Bury BL9 0NW

Lazy Jones — game — £8.95

TOSHIBA, Toshiba Hse, Frimley Rd, Frimley, Camberley, Surrey:

3D Golf
Polar Star
Pinball
Pyramid Warp
Battleship Clapton II
Games — £7.95 each

TASMAN, Springfield House, Hyde Terrace, Leeds, LS2 9LN:

Tasword — business — £13.90

V

VIRGIN GAMES, 2-4 Vernon Yard, Portobello Rd, London W11

Sorcery — game — £8.95

Overseas

ALALAMIAH ARABIC SOFTWARE PO Box 9196 Salmish Kuwait

English/Arabic educational cartridges — £32 each

SUBSCRIBE

Cut out and SEND TO:

MSX User

**Subscriptions,
Infonet Ltd,
Times House,
179 The Marlowes,
Hemel Hempstead,
Herts HP1 1BB**

SUBSCRIPTION RATES

(tick ☐ as appropriate)

£19.00 for 12 issues UK	☐
£21.00 for 12 issues overseas surface mail	☐
£53.00 for 12 issues overseas airmail	☐
$29.50 for 12 issues USA surface mail	☐

Subscription Order Form

Please commence my subscription to MSX User with the very next issue.

*I am enclosing my (delete as necessary) cheque/Postal Order/International Money Order for £:.....
(made payable to ASP Ltd)
OR
Debit my Access/Barclaycard* (*delete as necessary)*

We welcome Access

VISA

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Please use BLOCK CAPITALS and include post codes.

NAME (Mr/Mrs/Miss) .....

ADDRESS .....

.....

.....*POSTCODE*.....

Signature .....

Date .....

Word Van

Try this quiz devised by M.D. Shaw of Derby if you want to brush up your spelling.

After the van has made its delivery of balloons, one of each letter, a clue to the word's identity is given. If your guess is wrong then the van will deliver the next letter of the word to help you.

If you get tired of the same old set of clues and words you can alter the DATA lines 1590-1640. New words should not have more than 12 characters and clues should not have more than 28 characters.

Remember to use quotation marks around your clues.

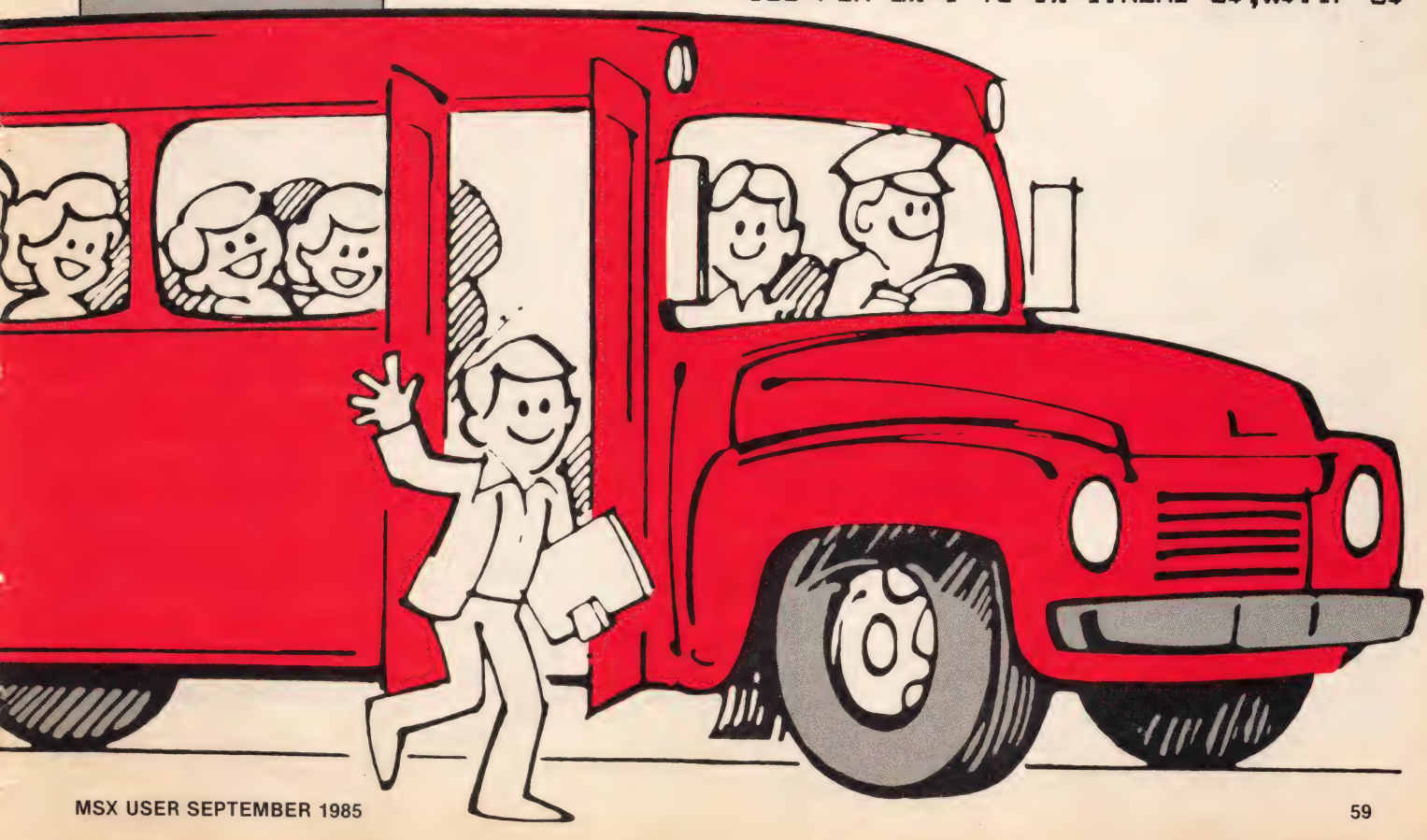
Program breakdown

10-250	set up variables and show instructions
260-360	next letter routine
370-510	print targets
520-610	van movement
620-740	erase routine
750-1110	screen set up
1120-1220	sound routines
1230-1440	instructions
1450-1470	end game
1480-1650	DATA statements

Main variables

B%	flag
P%	old start position
SC%	score
T%	total score
Z%	length of answer$
START%	position of faces on the wall
C$	clue
D$	tune
W$	answer
X$	user's guess

```
10 REM:M.D.SHAW
20 REM:JUNE 1985
30 CLEAR 500
40 OPEN"GRP:"FOR OUTPUT AS #1
50 GOSUB 1240:REM:INTRUCTIONS
60 RESTORE
70 GOSUB 760:REM SET UP
80 RESTORE 1590
90 IF I%=1 THEN GOTO110
100 FOR Q%=1 TO I%-1:READ C$,W$:IF C$
```



```
="XXX" THEN RESTORE 1590 ELSE NEXT Q%
110 SC%=0:T%=0
120 GOSUB 380:REM PRINT TARGETS
130 PSET(25,10),7:COLOR1:PRINT#1,C$
140 LINE(START%+5,155)-(START%+14+(Z%
*8),172),,B
150 B%=0
160 PSET(START%+12,160),14:X$=""
170 IF INKEY$<>""THEN170
180 COLOR 1
190 FOR F=1TOZ%
200 G$=INPUT$(1)
210 IF G$=CHR$(8) THEN G$="":F=Z%:GOS
UB 730 :GOTO 160
220 PRINT#1,G$;
230 X$=X$+G$
240 NEXT
250 IF X$=W$ THEN GOSUB 650 ELSE GOSU
B 270
260 '
270 REM:NEXT LETTER ROUTINE
280 '
290 T%=T%+1:LINE(160,182)-(255,191),2
,BF:PSET(160,182),2:PRINT#1,T%
300 FOR VAN%=-32 TO 223
310 GOSUB 530
320 IF VAN%=START%+(B%*12) THEN LINE(
START%+(B%*12),106)-(START%+(B%*12)+8
,113),7,BF:GOSUB 1190:COLOR 7:PSET(ST
ART%+(B%*12),106):COLOR 1:PRINT#1,MID
$(W$,B%+1,1)
330 NEXT VAN%
340 GOSUB 730
350 B%=B%+1:IF B%=Z% THEN F$="Sorry I
 beat you that time":T%=T%-1:GOTO 660
360 GOTO 160
370 '
380 'PRINT TARGETS
390 '
400 READ C$,W$:IF C$="XXX" THEN RESTO
RE 1590 :GOTO 400
410 LINE(0,10)-(255,28),7,BF:LINE(35,
104)-(216,113),7,BF:LINE(0,152)-(255,
177),14,BF
420 Z%=LEN(W$)
430 START%=(256-(Z%*12))/2
440 P%=START%
450 FOR VAN%=-32 TO 223
460 GOSUB 530:REM van movement
470 PSET(START%,106),7
480 IF VAN%=START% THEN COLOR 1:PRINT
#1,CHR$(1);CHR$(&H41):GOSUB1190:START
%=START%+12
490 IF START%=P%+(Z%*12) THEN START%=
P%
500 NEXT VAN%
510 RETURN
520 '
530 REM VAN MOVEMENT
540 '
550 PUT SPRITE1,(VAN%,108),1,1
560 PUT SPRITE2,(VAN%+32,108),1,2
570 PUT SPRITE3,(VAN%,108),8,3
580 PUT SPRITE4,(VAN%+32,108),8,4
590 GOSUB1120
600 SOUND7,255
610 RETURN
620 '
630 'ERASE ROUTINE
640 '
650 SC%=SC%+1:F$="Well done you guess
ed it !!"
660 LINE(82,181)-(95,191),2,BF:PSET(7
5,182),2:PRINT#1,SC%:T%=T%+1:LINE(160
,182)-(255,191),2,BF:PSET(160,182),2:
PRINT#1,T%
670 LINE(0,10)-(255,18),7,BF
680 PSET(25,10),7:PRINT#1,F$
690 PSET(30,20),7:PRINT#1,"Another go
 ? (y/n)"
700 IF INKEY$<>"" THEN 700
710 K$=INKEY$:IF K$="Y"OR K$="y" THEN
 120
720 IF K$<>"" THEN GOTO 1450 ELSE GOT
O 710
730 LINE(START%+6,156)-(START%+13+(Z%
*8),171),14,BF
740 RETURN
750 '
760 REM:SET UP
770 '
780 SCREEN2,3
790 COLOR1,7,7
800 CLS
810 FOR SP%=1 TO 4:A$="":FOR LOOP%=1
TO 32
820 READA%:A$=A$+CHR$(A%):NEXT LOOP%
830 SPRITE$(SP%)=A$:NEXT SP%
840 FOR TREE%=25 TO 217 STEP 192
850 PSET(TREE%,100):DRAW"C3LGL2HLHLHU
2HU3EUHUEUEUE7UERER5ERFRFR2FRF2RF2D2F
D3FD2GD2FD2GDGDG2L3HL3HL3GL2H2LG"
860 PSET(TREE%+1,102):DRAW"C1ERD13U13
F2R2D13U13E2F"
870 NEXT TREE%
880 LINE(0,114)-(255,130),9,BF
890 FOR WALL%=114 TO 130 STEP 4
900 LINE(0,WALL%)-(255,WALL%)
910 LINE(0,130)-(255,130),1
920 NEXT WALL%
930 FOR BRICK%=114 TO 122 STEP 8
940 FOR LOOP%=4 TO 252 STEP8
950 LINE(LOOP%,BRICK%)-(LOOP%,BRICK%+
4)
960 LINE(LOOP%+4,BRICK%+4)-(LOOP%+4,B
RICK%+8)
970 NEXT LOOP%
980 NEXT BRICK%
990 PAINT(29,104),1,1:PAINT(221,104),
1,1
```

```
1000 PAINT(27,95),3,3:PAINT(215,95),3
,3
1010 LINE(0,131)-(255,180),14,BF
1020 FOR ROAD%=0 TO 255 STEP 16
1030 LINE(ROAD%,150)-(ROAD%+6,150)
1040 NEXT ROAD%
1050 LINE(0,181)-(255,191),2,BF
1060 FOR GRASS%=1 TO 10
1070 R=INT(RND(1)*250):PSET(R,181)
1080 DRAW"C2R4L2NE2NH2"
1090 NEXT GRASS%
1100 PSET(40,182),1:PRINT#1,"Score 0
 out of 0  "
1110 RETURN
1120 SOUND 0,0:SOUND1,2
1130 SOUND 2,0:SOUND3,2
1140 SOUND 4,0:SOUND5,5
1150 SOUND 6,15:SOUND7,56
1160 SOUND 8,9:SOUND9,9
1170 SOUND10,9
1180 RETURN
1190 SOUND 6,31:SOUND 8,16:SOUND 11,1
03
1200 SOUND 12,20:SOUND 13,10:SOUND 7,
55
1210 FOR F=1 TO 400:NEXT:SOUND 8,0
1220 RETURN
1230 '
1240 REM:INSTRUCTIONS
1250 '
1260 KEY OFF:SCREEN 1,0,0:COLOR1,2,2:
CLS
1270 LOCATE 10,3:PRINT"WORD VAN"
1280 LOCATE 10,4:PRINT"________"
1290 LOCATE 9,5:PRINT"__________"
1300 LOCATE 4,22:PRINT"Press spacebar
 to start"
1310 B$="Can you guess the word from
the clue given ?       If you can't,
the WORD VAN will bring a letter.....
.............. "
1320 Z$=STRING$(29," ")+B$
1330 X%=1
1340 RESTORE 1650
1350 LOCATE 0,12
1360 PRINTMID$(Z$,X%,29)
1370 READ D$:IF D$="XXX" THEN RESTORE
 1650 ELSE PLAYD$,D$
1380 X%=X%+1
1390 FOR F=1 TO 40:A=STRIG(0):IF A=0
THEN NEXT ELSE F=90:CLS:GOTO 1420
1400 IF X%=LEN(Z$) THEN GOTO1330
1410 GOTO 1350
1420 CLS:LOCATE0,4:PRINT"Where do you
 want to start":PRINT:PRINT"In the cl
ue list (1 to 30)?":LOCATE0,15:PRINT"
Press RETURN after typing in the numb
er.":LOCATE0,20:PRINT"Please make sur
e the CAPS    light is ON."
1430 LOCATE0,12:INPUT L$:I%=VAL(L$):I
F I%<1 OR  I%>30 THEN CLS:GOTO 1420
1440 RETURN
1450 REM:END ROUTINE
1460 SCREEN 1,0,0:COLOR 1,2,2
1470 LOCATE5,12:PRINT"Thank you for t
he game":PRINT:PRINTTAB(5)"I enjoyed
it...":PRINT:PRINT:PRINT
1480 '
1490 REM:DATA
1500 '
1510 DATA 31,16,31,57,121,121,120,124
,126,127,127,127,253,248,5,2
1520 DATA 240,8,255,255,255,255,255,1
27,0,0,255,255,255,255,0,0
1530 DATA 0,48,255,248,248,248,248,25
5,0,0,255,255,255,255,0,0
1540 DATA 0,0,192,160,144,136,132,254
,254,0,254,254,223,143,80,32
1550 DATA 0,0,0,6,6,6,135,3,1,128,0,0
,2,7,2,0
1560 DATA 0,0,0,0,0,0,0,128,255,255,0
,0,0,128,0,0
1570 DATA 0,8,0,0,0,0,0,0,255,255,0,0
,0,0,0,0
1580 DATA 0,0,0,0,0,0,0,0,0,0,255,0,0,3
2,112,32,0
1590 DATA"Something to eat",FOOD,"Use
s rotors to fly",HELICOPTER,"Obtained
 at a checkout",RECEIPT,"Book of word
s",DICTIONARY,"Gives out light",LAMP,
"Past events",HISTORY,Mockery,RIDICUL
E,"Yeilding easily to pressure",SOFT,
"Territory of a nation",COUNTRY
1600 DATA Baby,INFANT,"Can be seen th
rough",TRANSPARENT,"Professional hors
e rider",JOCKEY,"It cannot be done",I
MPOSSIBLE
1610 DATA "Magnifies small objects",M
ICROSCOPE,"A single humped camel",DRO
MEDARY,"Author unknown",ANONYMOUS,"To
 make smaller",DECREASE
1620 DATA "Edible fungus",MUSHROOM,"P
ut down or subdue",SUPPRESS,Tired,WEA
RY,"A slender thread",FILAMENT,"Type
of winch",WINDLASS
1630 DATA "A four footed animal",QUAD
RUPED,"Copy without authority",COUNTE
RFEIT,"Young person",JUVENILE,"Animal
 with a very long neck",GIRAFFE
1640 DATA "To operate with the hands"
,MANIPULATE,"A drawback",DISADVANTAGE
,"Strong or brave",STALWART,"A light
sailing vessel",YACHT,XXX,XXX
1650 DATA T230V1003L4C,C,E,G,O4L2C.,O
3A.,A,L4A,F,G,A,L2G.,G.,G,L4G,C,E,G,L
2G.,D.,D,L8D,E,L4A,E,D,L2C.,C.,C,L4C,
C,E,G,O4L2C.,O3A.,A,L4A,F,G,A,L2G.,G.
,G,L8G,G,L4C,E,G,L2G.,D.,D,L8D,E,L4F,
E,D,L2C.,C.,L4C,R4,R4,XXX
```

First Aid

If saving pictures to tape is your problem, Steve Webb has the answer

I have had several letters from people asking the following: 'how can I save on to tape a picture which I have designed and is on the screen?'

I will firstly explain exactly what the screen is then I shall go on to explain how you can save your masterpiece to tape. The following description applies to screen mode 1; however, the principles involved also apply to the other screen modes. All information which appears on the screen such as the shape and colour of the characters and sprites are stored in an area of memory called the video RAM.

In screen mode 1 it is possible to have up to 256 character shapes numbered from 0 to 255. Each character uses 8 bytes of memory to describe its shape as shown in **diagram 1.**

Therefore 2048 bytes of memory are used to store the shapes of all of the 256 characters. What happens on your actual TV screen depends on what is stored in an area of the VRAM known as the screen map. This map is 32 cells wide by 24 cells deep corresponding to the 32 x 24 screen mode 1. Each cell can hold a number between 0 and 255.

It is the contents of these cells which decide what characters will appear at their corresponding positions on the screen. If the first cell contained the number 65 then the letter A would appear in the top left hand corner of the screen. This is because the letter A is the 65th character in the character definitions. If you put the number 65 into the 32nd cell then the letter A would appear in the top right hand corner of the screen.

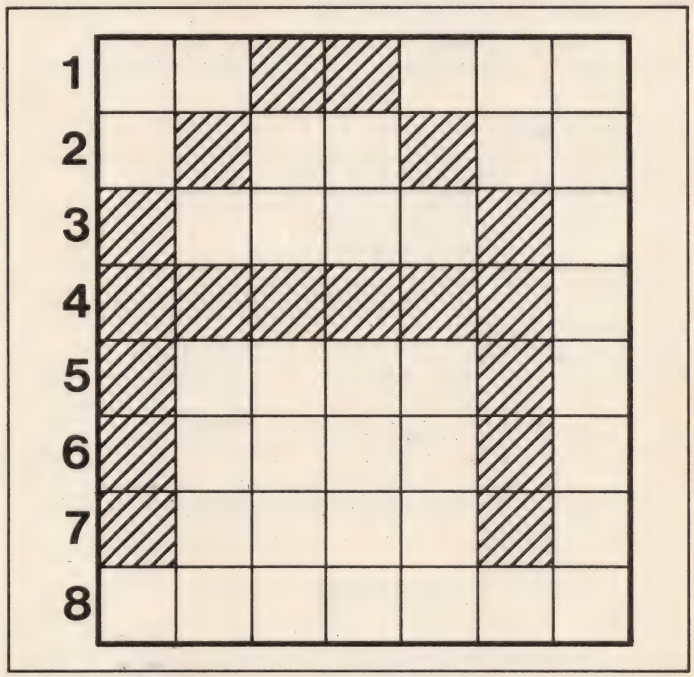


Diagram 1

You should now have an understanding of how the picture and characters which make up the picture are stored in the VRAM. If you have not redefined the standard MSX character set, then to save your picture all you have to do is SAVE the 768 bytes of the screen map. However, if you have designed your own character set it will also be necessary to SAVE the 2048 bytes of the character set as well.

I will show you how to SAVE the character set and the screen map. Normally the character set is stored from location 0 to 2047 in VRAM and the screen map is stored from 6144 to 6911. These locations can be confirmed by typing the following:

PRINT BASE (7)
PRINT BASE (5)

These two commands

will print out the start addresses of the character definitions which should be 0 and the screen map start address which should be 6144. If yours are different then you will need to alter the numbers in the following SAVEing and LOADing routines, but this will not be difficult.

As you cannot SAVE VRAM directly it is necessary to transfer the required block of memory, in this case 0 to 6911, from VRAM into the ordinary RAM where your programs are normally stored. This is done in the following way. First type CLEAR 200, 49999.

Now enter or add the following lines to the BASIC program which you already have.

```
FOR A = 0 to 6911
POKE (50000 + A),
VPEEK (A)
NEXT A
```

These three lines of BASIC will transfer your picture from VRAM to locations 50000 onwards in the normal user RAM. (Of course your picture must have actually been displayed on the screen before you execute the transfer routine). Now you can SAVE the picture to tape using the following command:

```
BSAVE "CAS:PICT",
50000, 56911
```

To load and transfer the picture back into VRAM simply enter and RUN the following program.

```
CLEAR 200,49999
BLOAD"CAS:PICT"
FOR A = 0 to 6911
VPOKE (A),PEEK
(A + 50000)
NEXT A

(Your program)
```

Your program should follow on directly after the transfer back to VRAM or else the "READY" message will be printed over your picture.

That's all for this month. Don't forget, if you have any questions then send them to me and I'll do my best to answer them.

ASK FOR OUR FULL SOFTWARE LIST

YOUR No 1 MSX CENTRE
SYSTEM

ONLY A SMALL SELECTION OF OUR SOFTWARE

KONAMI
SUPER COBRA....£16.95
COMIC BAKERY....£16.95
TRACK AND FIELD 1....£16.95
HYPER SPORTS 1....£16.95
ANTARCTIC ADVENTURE....£16.95
TENNIS....£16.95
MOPI RANGER....£16.95
SKY JAGUAR....£16.95
GOLF....£16.95
CIRCUS CHARLIE....£16.95
TIME PILOT....£16.95
TRACK AND FIELD 2....£16.95
ATHLETIC LAND....£16.95
MONKEY ACADEMY....£16.95
HYPER SPORTS 2....£16.95
YIE AR KUNG-FU....£16.95
KINGS VALLEY....£16.95
HYPER SHOT....£15.85

SOFTWARE PROJECTS
JET SET WILLY....£7.95
MANIC MINER....£7.95

GST/ELECTRIC
SHARK HUNTER....£8.95
ZAXXON....£11.95
NORSEMAN....£8.95
LE MANS....£9.95
BUZZ OFF....£7.95
BUCK ROGERS....£11.95
THE WRECK....£14.95
BACKGAMMON....£9.95

LEVEL 9 COMPUTING
COLOSSAL ADVENTURE....£9.95
ADVENTURE QUEST....£9.95
LORDS OF TIME....£9.95
EMERALD ISLE....£6.95
SNOWBALL....£9.95
DUNGEON ADVENTURE....£9.95
RETURN TO EDEN....£9.95

ANIROG
FLIGHTPATH 737....£8.95

COMPUTER MATES
CARDS FILING SYSTEM....£49.95
MAILSHOT, WORDPROCESSOR & CARDS....£99.95
SPREADSHEET....£49.95
WORDPROCESSOR....£49.95
CASH ACCOUNTS....£128.95

MELBOURNE HOUSE
THE HOBBIT....£14.95
BOOK-MSX EXPOSED....£6.95
BOOK-MSX PROG'S REF. GUIDE....£14.95
CLASSIC ADVENTURE....£6.95
BOOX-MSX GAMES BOX....£6.95

SHIELD
CHEMISTRY O-LEVEL EXAMINER....£9.95
PHYSICS O-LEVEL EXAMINER....£9.95
MATHS O-LEVEL EXAMINER....£9.95

ACTIVISION
BEAM RIDER....£11.99
PITFALL II....£11.99
GHOSTBUSTERS....£11.99
DECATHLON....£11.99
RIVER RAID....£11.99
HERO....£11.99

VIRGIN GAMES
SORCERY....£8.95
USEFUL UTILITIES FOR MSX....£2.99
PRACTICAL MSX MACHINE CODE....£4.95

D.K. TRONICS
MINDER....£9.95

RITTOR MUSIC
P.S.G. MUSIWRITER....£20.85

ORPHEUS
BOLDERDASH....£6.95

TERMINAL
LAZY JONES....£8.95

PHONE US NOW FOR OUR SPECIAL SUMMER OFFERS ON MSX COMPUTERS

BUY FROM THE EXPERTS — WITH CONFIDENCE

ALL SOFTWARE NORMALLY STOCKED AND DESPATCHED BY RETURN

TAVISTOCK HI-FI LTD

21 THE BROADWAY, BEDFORD MK40 2TL
Tel: Bedford (0234) 56323

ORDER

TOTAL £

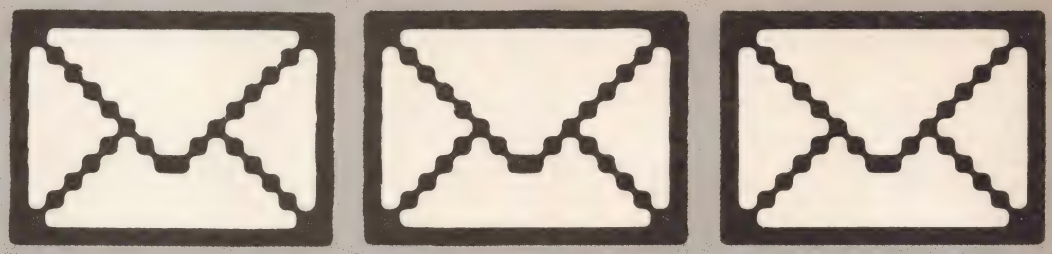
All prices include VAT and post and packaging. All items include a full year guarantee. Products are stocked and usually despatched within 2 days. Overseas customers add £4 post and packing. Cheques (with cheque Card No.), Postal Order, etc., payable to TAVISTOCK HI-FI LTD. Telephone orders (0234) 56323. Please debit my Access/Barclaycard.

Card Number
Signature
Name
Address

MSXU9/85

MSX

Feedback



Printer back-up

Dear Sir,
This letter was composed on a Toshiba HX-10 computer and printed on a Toshiba HX-P570 plotter/printer. I read the article on page 25 of the June issue of your magazine with great interest. I am well pleased with the performance of the printer but not with the back-up on consumables such as pens and rolls of 114mm paper. Toshiba agents charge £12.99 for a set of four colour pens and claim that the rolls of paper are obtainable at any large branch of W H Smith which is not true.

Please let me know where Graham Knight obtains pens at 75p each. Lasky's in Bristol who were unable to supply pens for the Sony PRN-C41 Plotter, which they stock, quoted about £15 per set of four pens! I am at the moment using a set of four Silver Reed pens for their EB 50 typewriter, cost £4.50 the set from W H Smith.

I have also tried a set of Brother pens for their similar BP 50 typewriter. Although identical in appearance these are nearly 2mm longer and cannot rotate in the Carousel. Such is Japanese standardisation! I would appreciate your comments.

J S Walmsley
Portpatrick
Wigtownshire

A set of four pens is available from Knights TV and Computers, 108 Rosemount Place, Aberdeen for £2.99 per set. Further information has been supplied in a letter from J Crane of Liverpool.

If the pens on the MSX printers runs out of ink they can be got at Tandy's. A set of three black or three coloured pens cost £1.99.

I take the ball-point retainer off the end of mine and fill them up with pad ink and then put the end back in.

Another hint from Mr Crane is not to leave them in the printer when not in use but to store them in their original packaging.

Model questions

Dear MSX User,
I have a few questions which I think you may be able to answer.

Will software produced for the MSX mark 2 machines run on the present models or will we all be left with obsolete machines?

Where does screen memory begin?

How can I get through the forest in **The Hobbit** without being killed by the 'pale bulbous eyes'? I have tried waiting three times before moving which works on other computers. And how do I get the golden ring and escape from the goblins' cave?

D.J. Welch
New Malden, Surrey

First question: any program for the new machines that does not use an 80 character screen width will also run on the old machines, so they will not be obsolete.

Question two: unlike most micros, the MSX screen memory is held on a 16K video chip which is separate from the ordinary 64K RAM.

As for The Hobbit, you must first get the ring which Gollum has with him in the Goblins' caves. Then find an opening in the roof and ask Thorin or Gandalf to help you climb out, and wear the ring in the forest.

Listing wanted

Dear MSX User,
I have owned my Toshiba HX-10 for some three and a half months. After knowing nothing of computers I have learned a lot but still have a long way to go.

What does annoy me is the lack of MSX accessories in our area. This is where your magazine has been a great help to me and my children.

Now then, what about a program for cataloguing my record collection (LPs and cassettes), perhaps on similar lines to Address Book in your March edition. I am sure there are many MSX users with large record collections like myself, but who can't even start to write a program.

I do hope you can help.

H.P. Jones
Bromsgrove,
Worcestershire

Over to you, readers.

Missed bus

Dear MSX User,
The January issue of your magazine reviewed the Sony HB-75 and I quote: 'The Sony has two cart ports, but it needs to be emphasised that . . . this is merely a duplication, not an extra. Sony strongly advise against using both.'

I cannot find any reference to this in my manual. I wonder if you have any more recent information? I am particularly interested because the Hit Bit does not have an expansion bus.

Dudley Baker
Fakenham, Norfolk

In theory, both ports can be used but will only be effective if each cartridge accesses a different area of memory. If both cartridge ports are used with programs accessing the same area, for instance two games, then the upper port will be given preference.

M/C pen friend

Dear MSX User,
MSX is growing fast in Holland. Unfortunately there are only a few MSX machine code programs, so I should be glad to correspond with a British machine code programmer. I am interested in a machine code disk drive control program and in BASIC ROM subroutines but other subjects are welcome.

E. Wong
Wolfsenwaard
6932 BL Westervoort
Netherlands

Lady owner

Dear Sir,
I don't know how many lady MSX owners there are about but most of the letters appear to come from men, so I felt I ought to get a word or two in.

First, I own a Toshiba HX10 — purchased with the intention of eventually using it for our business (although I'm not quite certain just how much use it will be to us yet until I'm more familiar with it). Do you know of any suitable packages for the garage/filling station trade, apart from the run-of-the-mill stock control/bookkeeping packages?

Second, I had a **French is Fun** tape with my machine but there appeared to be a fault on Section 8 — Numbers and Counting. I sent this back to CDS in early March requesting an exchange, but I haven't heard a word since. Needless to say, I have now followed up my original letter so here's hoping!

Last, but not least, I'd like to know if anyone is going to produce Scrabble on the MSX system. Can you help?

(Mrs) D.A. Jones
South Molton
Devon

We have not heard of any package designed specifically for the garage trade, nor do we know of any forthcoming MSX Scrabble programs. But who knows? It may just be a matter of time.

MAX presents EXPRESS

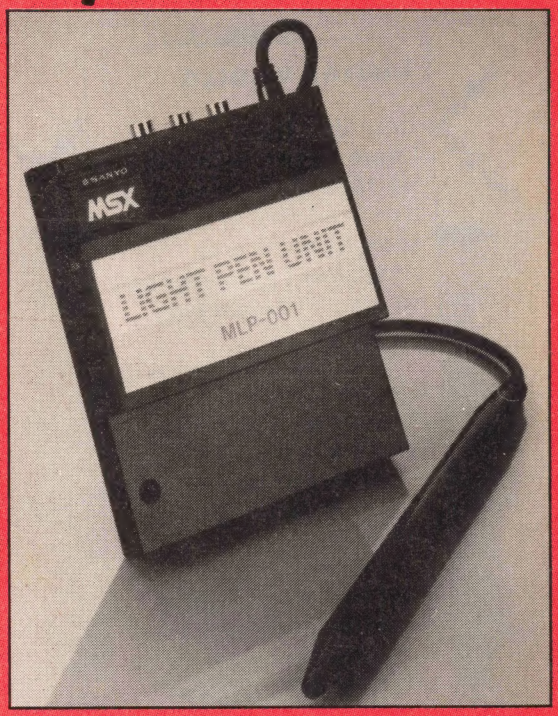
A new utility for the 64K MSX machines offering high speed back up copies.

* **LOADS all tested software**
* **SAVES software in a choice of 4 save speeds**
* **CATALOGUE of files on tape to VDU or PRINTER**

Price £6.00 (Europe add £1.00p/p)
R.O.W add £1.50p/p
Cheques payable to MAX.
23 Derby Road, Luton, Bedfordshire LU4 0DH

Lightpen Winner

Is this how MSX will change life in the home? The best entry in our June contest says it all



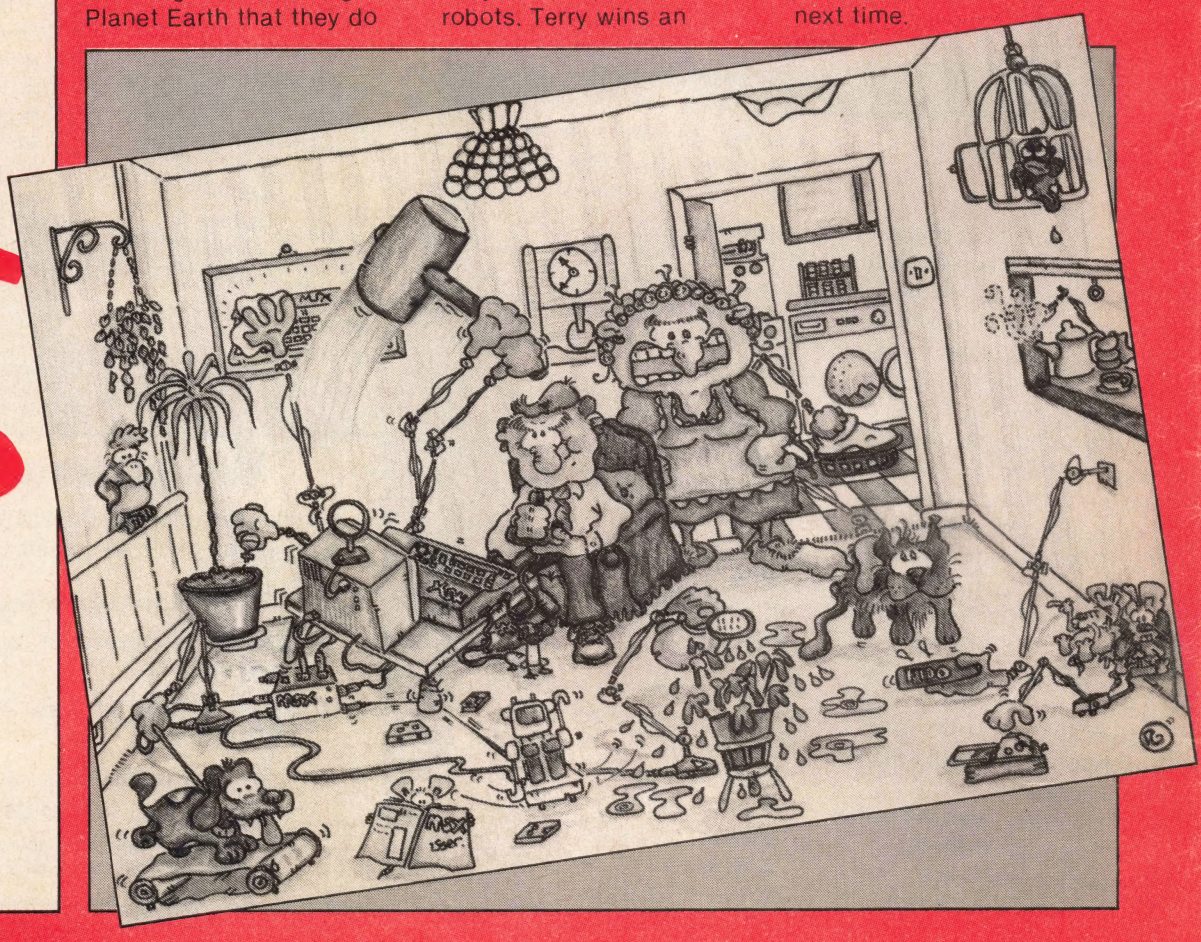
The prize — a Sanyo Lightpen

Far and away the best entry to the Sanyo Lightpen competition announced in our June issue was the cartoon submitted by Peter Gilmour of Bedford. The theme of the competition was funny situations which can arise in the home when using an MSX, to be illustrated by hand or by computer.

Peter Gilmour, as you will see by close study of his winning entry, seems to have thought of most possible ones, and we are confident that he would have won without too much difficulty even if we had received many more entries than we did (are MSX users so busy typing in listings or defending Planet Earth that they do not have time for a bit of frivolity?)

Special mention must also go to Terry Matts of Leicester who sent us a painstakingly programmed and enjoyable animated cartoon sequence on the subject of explosive robots. Terry wins an impromptu runner-up prize of Electric Studio's two-part graphics package, **Sprite Editor** and **Graphic Designer.**

Many thanks to all those who took part. Sorry you couldn't all win a lightpen, and better luck next time.



All MSX computers are built to the same standard.

That's what makes our first one different.

At Pioneer we've never believed in following the crowd. We prefer them to be one step behind us.

And with our innovative reputation in Hi-Fi and In-Car Entertainment, people tend to demand rather special things from us. Our new PX-7 home computer is just that.

It has all the benefits you'd expect from a standard MSX home computer, but with a few added talents.

No other home computer enables you to create your own art and animation like the PX-7.

Up to 16 different colours are available and by using the optional PX-TB7 graphics tablet you can create illustrations, shapes and various backgrounds. Then store up to eight of these shapes with their respective animation programmes in the computer memory.

Moving Pictures. Use the PX-7 in conjunction with a video or LaserDisc* player to superimpose your graphics, creations or titles onto a moving video picture. The PX-7 can also produce stereo sound with three different voice patterns over eight octaves and superimpose them over other sound sources.

Video control. When used in conjunction with our SD-26 component television and LD-700 LaserDisc* player, the PX-7 has the added versatility of being able to understand and control the complete system.

So if you're looking for a home computer that's versatile, talented and one step ahead of the crowd, remember there's only one. The Pioneer PX-7.

Phone 01-200 0200 for your nearest PX-7 dealer.

PIONEER®
The future of sound and vision

*LaserDisc™ is a trademark of Pioneer Electronic Corporation.

LaserVision The LaserVision trademark certifies compatibility with other laser optical video products bearing the mark.

A top quality daisywheel printer at a rock bottom price.

Take a closer look at the JUKI 2200.
In a fully portable daisywheel printer, the technology could hardly be higher.
At just £299.–, the price could scarcely be lower.
The JUKI 2200 is compatible with most leading personal computers, and ideal for use at home. Its advanced professional specification includes serial or parallel interface, print speed of 10 characters per second, 2k buffer memory and full word processing support. It uses the standard Triumph-Adler* daisywheel (available just about everywhere) and, like all JUKI products, comes with a comprehensive, easy-to-read User's Manual. Yet, complete with compact carrying hood, the JUKI 2200 weighs less than 14 lbs.
You'll be delighted with its crisp, clear printout, especially when you know that the JUKI 2200 can also be used as a high-grade electronic typewriter.

See for yourself. Ask your local JUKI dealer.

The JUKI 2200. You'll search high and low to beat it.

* Triumph-Adler is a trade-mark of TRIUMPH-ADLER AG.

JUKI

Technology true to type

JUKI (EUROPE) GMBH
Eiffestr. 74 · 2000 Hamburg 26 · F. R. Germany
Tel.: (0 40) 2 51 20 71-73 · Telex: 2 163 061 (JKI D)
Fax.: (0 40) 2 51 27 24.

Sole distributor:
Micro Peripherals ltd
Intec Unit 3, Hassocks Wood, Wade Road,
Basingstoke, Hants, RG 24 ONE.
Tel.: (0256) 47 3232 (32 lines)
Telex: 8 59669 MICRO PG
Facsimile (0256) 46 1570

JUKI (EUROPE) GMBH
DATE 14.Apr.1985
Juki (Europe) GmbH
* * * PROUDLY PRESENTS * * *
The Juki Model 2200 Daisywheel printer
The Juki Model 2200 is the higher functional model equipped with interface for Read Only Printer. When using for Read Only Printer, carriage motion changes to Bi-directional.
FEATURES
* 10 CPS Maximum printing speed
* Uses Triumph-Adler Daisywheel
Praxis Ribbon
* Clear horizontal tab stop at current print position
* Perform negative half
* Set line space 1
* Set line space 1-1/2
* Set line space 2
JUKI
2200
IBM

JUKI 2200